COMPUTERWORLD

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OCR Device Will Interface With System/3 and 360/20

By Frank Piasta
CW Staff Writer

DALLAS – A low-cost OCR device designed to replace the 96-column card reader as the principal source of input to the IBM System/3 was announced last week by Recognition Terminals, a division of Recognition Equipment, Inc.

Called Input 3, the device can read variable-sized pages with up to 22 lines of handprinted numbers and symbols as well as machine-printed information, according to the company.

"It is designed for use in decentralized information processing environments where the volume of data is relatively small, but important, and must be transmitted on- or off-line to central or regional computers," according to Herman L. Philipson Jr., president of Recognition Equipment.

Input 3 can be connected directly to an IBM 360/20 and other computers, as well as to System/3. Standard software provides this capability without modifications to the manufacturer's or the user's programs, Philipson said.

Input 3 can also be used as a stand-alone configuration to read and collect localized or smaller amounts of data for teleprocessing.

Input 80

Two additional devices were unveiled by Recognition Equipment. One of them, the Input 80, is a page-reading OCR device designed to prepare computer input for users with batch-processing requirements where a variety of type styles, including handprinted numerics and symbols, must be read.

Input 80 reads information from full-sized typewritten pages at a speed of more than 2200 page/hr. Recognition Equipment said that more than 500 hours would be required to keypunch a similar quantity of data.

Smaller pages with only one line of material can be read at about 18,000/hr, the company said. The unit is scheduled for first deliveries late in 1971.

The other device announced is the Input Image Recorder that can microfilm and index documents while they are being read by an OCR device. [CW will describe this device in the June 17 issue.]

Described as the first image

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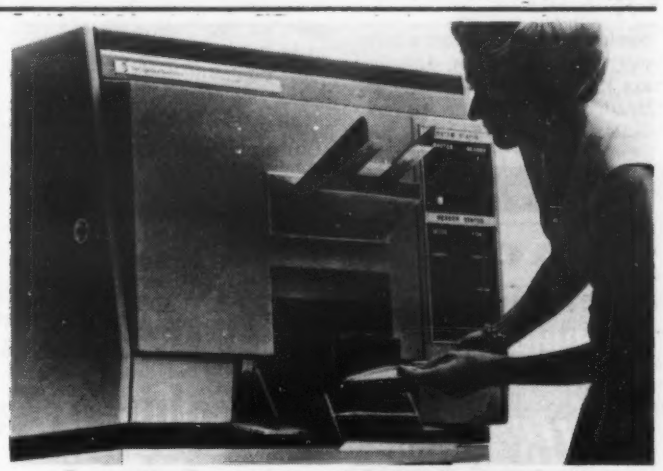

Recognition Terminals Input 3 Optical Character Reader

Compatible Software Added

CDC 6000, 7000 'Super' Series Expanded

By Peter L. Briggs
CW Staff Writer

NEW YORK – Control Data Corp. (CDC) has extended the flexibility of the 6000 and 7000 supercomputer series with new versions of the 7600, a new 6200 system, and the compatible software to facilitate user upgrading through both of the series.

The 7600 now comes in four configurations; the original complete 7600, with prices ranging from about $8 million to 12 million, is now called the 7613; a slightly smaller version, with half the memory, is called the 7614; the 7615 offers the same size main memory but a smaller main memory and a smaller SCM. Prices now range from about $4.5 million for the smallest 7616, to the full $12 million for the 7600 itself.

Memory Cycle Times

Memory cycle time for SCM processors is 275 nsec while the memory cycle time for the Large Core Memory (LCM) units is 1.76 μsec. All models in the 7600 series will have the same central processor power but will differ in throughput based on the memory size of each system.

With the multiple configurations of the 7600 scheduled to be available for shipping early next year, CDC now offers a very complex mixture of hardware capabilities. It offers, however a separately priced consulting service to assist customers in proper equipment selection and configuration design.

The effective cycle time of the SCM with 32-way interleaving is 27.5 nsec, according to CDC. The main memory cycle times are much slower than the SCM, but it will transfer one word (60 bits) every 27.5 nsec, to keep the processor busy, the company said.

The operating system requires about 6,000 words of the SCM and controls memory accesses between the main and the control memory. The various peripheral processor units (PPU) communicate with the various central processors over 12-bit channels at speeds up to about 240,000 char/sec, the company said.

The minimum new 7616 comes with seven I/O channels and six PPUs. Channels, up to a maxi-

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California Controversy Over Vote Count Threatens Use of Punched-Card Method

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – A computerized vote count stirred up a controversy last week in California that threatens the further use of punched-card voting in government elections.

In one area, Fresno County was unable to start its tally because of programming problems. Before election day had even started in Los Angeles a suit was filed to prohibit computer counting of one district's judgeship election and to impound all county ballots.

The day following the state primary election, with the vote count still not completed and not expected for another day, Dr. Leonard Larks, head of the Democratic Party Los Angeles election Certification Board, said: "The Democratic Party refuses to certify the election. We can't. We don't know what happened."

Larks expressed concern over five core dumps which occurred during the evening for no apparent reason. "What is required is that the core dumps be impounded and a neutral firm called in to read them and see what happened."

Harold Wilson, head of the Republican Party observers team, said he didn't see anything that indicated a computer malfunction or reason to investigate the core dumps. "I'm not upset but I am concerned about the election," he said. "Systematically we are going through things that we don't have answers for and we are proving the validity of the count. We think that all the actions and reactions were due to the huge logistics problems involved and inexperienced or inadequate help."

The board of supervisors held a meeting on the subject the day following the election and agreed to appoint another blue ribbon committee to investigate the vote problems.

Irregularities

During this period a large number of irregularities were reported. Main complaints concerned the non-delivery of 40,000 sample ballots; failure to mail, as promised, some notices advising citizens where to vote; failure to enclose some candidates' literature; wrong addresses for polling places; wrong configurations in the sample ballots; and the mailing of one party's ballot to another party's member. All voting lists and mailings are handled by computer.

A major cause for concern in

(Continued on Page 2)

Computers at War

Army DP Vital to Viet Effort

By Bernice Pantell
Special to Computerworld

LONG BINH, Vietnam – The U.S. Army is the largest user of computers in Vietnam. It also has the most mixed results.

It can only try to explain some of the incredible operating difficulties of its Inventory Control Center in Long Binh.

But it can point with pride to its 61 NCR 500 computers installed in mobile vans throughout III Corps and IV Corps where most Army operations are centered.

III Corps surrounds Saigon, extends north 100 miles, and south as far as the Delta. IV Corps is in the Delta area.

In these areas, Army units are dug in and their NCRs are dug in with them. Bearcat is an excellent example, 20 miles southeast of Saigon, in the center of VC-held territory, completely rimmed in by barbwire strung with beer and Coke cans.

At first one thinks the cans are someone's wry effort at decor, but suddenly it becomes obvious the cans are strung there so that "Charlie" cannot slip through some dark night and tear up the joint.

Bearcat is so isolated and surrounded by such desolation that the mobile vans housing the NCR 500 and the tab equipment are no longer mobile.

Our troops there have nowhere to go when attacked so they have surrounded the vans with

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Session '70 Is Warned of DP's 'Two-Edged Sword'

By Robert L. Glass
Special to Computerworld

VANCOUVER, B.C. – The challenge of "Computers, Privacy and the Law" was laid squarely in the lap of the data processing community by John N. Turner, minister of justice and attorney general of Canada, in his opening address at Session '70 last week.

Session '70 was a joint conference of the Canadian Information Processing Society and the Canadian Operational Research Society. It was the first time these two organizations held a joint national conference, and the session brought together 700 attendees.

Turner described data processing as a "two edged sword" whose cutting edge could work to help or to hinder justice and the law.

Turner spoke, both in his address and at a later press conference, of the "obvious need for some type of regulation" to prevent computerized data from destroying human privacy.

Legislation in the area of electronic surveillance should become fact in Canada this fall; legislation in the area of data processing surveillance is at least a year away, he predicted. The interim period should be used for gathering information on the problem, he said; hence the challenge to conference attendees.

He spoke of the need for legislation to protect privacy as a "priority item," and said "justice delayed is justice denied."

The data processing community was given a set of questions to be answered as part of its challenge:

Who will be allowed to gather information? What kind? Who will be allowed access to information? Under what controls? How will information be verified and validated? In what circumstances?

What information will be transmitted? To whom? What sanctions will be available? To whom? What procedures will govern the answers to the above questions?

6000, 7000 Series Flexibility Extended

(Continued from Page 1)

mum of 15, can be added four at a time. PPUs can be added, one at a time, up to a maximum of 13. This minimum processor offers 32K words of SCM, and 256K words of main core memory.

The 6200, a medium-priced machine, rents from $21,000 to $57,000/mo. The 6200 also uses the Scope operating system as well as the Kronos interactive terminal system, according to CDC.

The 6200 system can be field upgraded to a 6400, or a 6500, CDC said. Main memory comes in options of 32K, 48K, and 64K configurations, with up to two-million words of Extended Core Storage, at much lower speeds (also available as an option).

The 6200 PPUs, as with those machine, rents from $21,000 to memories with 12-bit words. For special large configurations, up to 20 PPUs can be connected to the central system.

CDC Claims a Family

With these hardware additions, CDC now offers a family of computers, said to be compatible, renting from the lowest 6200 ($20,000/mo) to the largest 7600 (renting for about $220,000/mo). All systems are said to work around the same operating software, Scope.

The Scope operating system consists of a multiprogramming supervisor with multiprocessing through the peripheral I/O stations, dynamic memory allocation, time slicing and scheduling algorithms, and complete interfaces for the various I/O stations, according to CDC.

Current Scope languages now include three Fortran compilers, a Cobol compiler, the Compass assembly language, a Sort/Merge program, an overlay loader, a system maintenance routine called Update, various system utilities, built-in file structures, and storage management for on-line random storage either in sequential or random operation.

OCR Device Can Replace 96-Column Card Reader

(Continued from Page 1)

capture method that microfilms as part of a data capture operation to eliminate an entire step in the data processing function, the microfilmer can be used with the Input 80 or earlier Recognition Equipment OCR devices.

The Input 3 is available in two models, either as a small-page reader or as a single-line document reader. The page reader can process up to 22 lines of information from pages ranging from 3-1/2 in. by 4 in. to 6 in. by 9 in., throughput rate being determined by the number of lines and the font read.

Reading rate is 75 char/sec for any of the available machine fonts and 22 to 30 char/sec for handprinting.

Developed for reading turnaround documents such as premium and invoice stubs, the document reader reads one line of information from each page, which can range from 2-1/4 in. by 3-3/4 in. to 6 in. by 9 in. Throughput rate of the device is 60 document/min.

The Input 3 can read handprint plus any one of the machine fonts on a single page.

The basic machine can read either of two 48-character alphanumeric fonts: OCR-A or OCR-B. An optional configuration substitutes handprint capability plus four numeric fonts (OCR-A, OCR-B, IBM 1428 modified, and IBM 1403).

In addition to being used on-line to a computer, the Input 3 can be configured as a stand-alone system. In addition to the reader, the system would include a controller and an I/O typewriter, plus an IBM-compatible 7- or 9-track, 800-bit/in. magnetic tape drive. An on-line communications configuration would add a communications controller and replace the tape drive with a low-speed (600 bit/sec) modem.

A variation of the communication system would allow faster transmission rates by using a tape drive as intermediate storage and a faster (up to 7,200 bit/sec) modem. This last configuration could function as a remote, unattended, pollable terminal.

Compared to figures of $1/1,000 char for keypunching and key-verifying and $.80/1,000 char for key-to-tape devices, the Input 3 is claimed by the manufacturer to cost about $.30/1,000 char, based on a four hour per day utilization, when used on-line to a System/3.

Monthly rental for the basic system will range from $950 to $1,400/mo, depending on configuration. The purchase price of the basic system would be $33,000, the company said. First customer deliveries are scheduled for the last quarter of 1970.

Vote Count Dispute Threatens Use Of Method in California Elections

(Continued from Page 1)

the area of irregularities was the misprinting of ballots which causes the voter's vote to be cast for someone different than he intended.

The Votomatic does nothing but produce a punched card. The ballot guides tell the voter where to punch a hole to register his vote for his candidate. The computer then reads these holes in the predetermined pattern. With misprinted ballots, the computer reads the holes as instructed but the voter has voted under different instructions.

Beverly Hills Municipal Judge Leonard Wolf obtained a temporary restraining order prohibiting a computer count for his district after he found, by checking pre-election supplies, that about 20% of the ballot books in his district did not list the candidates correctly. Mayor Sam Yorty, a candidate for governor, found that in his precinct his votes would have gone to an opponent. In one district he was listed twice.

When Les Rivers, chairman of the campaign committee of the Los Angeles Democratic Central Committee, was asked what his group was going to do about the problem, he said wearily: "If we wanted to impound all the . . . ballot books and check the pages one by one we could do it, but we're not going to. We'll take the registrar's word for it that he's found all the errors and those precincts will be counted by hand." A hand inspection would mean checking ballot books for 21,501 precincts.

Hand Count Impossible

Wolf said that it is impossible to even hand-count his district since he found cases where two out of three of the Democratic books would be printed correctly but not the third. "As all the ballots go into the same hopper it is impossible to know which punched cards followed which ballot guides."

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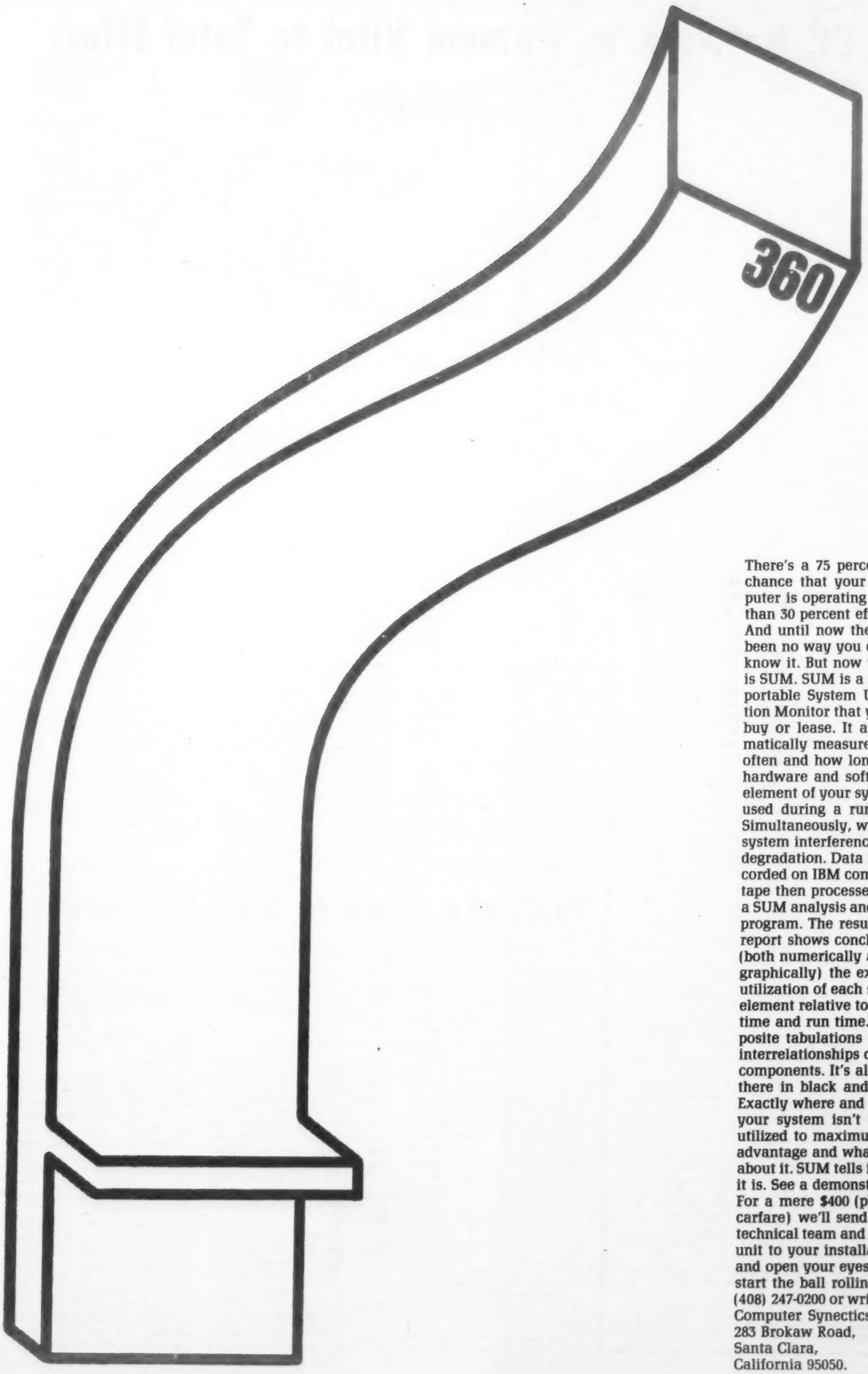

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Army's DP Network in Vietnam Vital to Total Effort

(Continued from Page 1)

protective cement.

Supply Control

The NCR 500 is used for supply control for units in the field. It controls items needed for support which are carried as regular stock.

The troops try to keep regular stock on hand all the time, though this is a somewhat different problem in the field than in a well-protected dept. Much of the material remains in the open, exposed to enemy fire and the weather (which is as great a threat as the enemy).

Their stock levels, communications and backup at the nearest depot must reflect these conditions.

They must process supply records as frequently as possible and have pretty good detection procedures to alert them to erroneous data, insufficient stock, and other undesirable conditions.

All this is accomplished on the NCR 500s. The programs for these computers are written at the Computer Systems Command in Ft. Belvoir, Virginia. The men who operate the NCR in the field receive their training at Ft. Lee.

They do not write their own programs and they seem to be well disciplined about not patching the ones they get from the central agency.

This may account for their success in operating. Obviously, the programs fulfill the particular needs they have; otherwise the familiar patching would inevitably occur.

11 Univac 1005s

The Army also has 11 Univac 1005 units installed at larger bases throughout III Corps and IV Corps to maintain personnel records. These are small 4K card systems that are quite adequate for recording and updating personnel data on the men in the various commands.

They also operate on a centralized concept, processing standard programs sent from a central agency in the States, run by men trained in a central location.

Only when looking at the Army's depot and central inventory control system do we see a departure from the concept of running under a standard system, using packaged programs, run by men trained in the system in the States.

The Army has an Inventory Control Center (ICC) in Vietnam and operates it to control assets stored in four major depots throughout Vietnam. There is a standard Army supply system (3S), but it has been modified for Vietnam and is known as 3S/VN.

The Army has contracted with Computer Sciences Corp. to help maintain 3S/VN, both at the ICC and at the depots. The ICC has an IBM 360/50 system with 2314 disk and high-speed tape, plus a 7010/1460 system with 2302 disk and high-speed tape, plus a complete Stromberg-Carlson mag tape to microfilm system. Three of the depots have 7010/1460 tape systems, while the fourth, at Da Nang, has a Univac 1005 system. All these installations are tied together into a transceiver hookup. This is a huge network of equipment for a single inventory system, and the workload of the system is correspondingly large.

The ICC processes four million transactions a month, two million for the depots and two million for centralized operations. It also runs its own training programs, since most of the men assigned to 3S/VN have had little or no training in the system in the States.

The troops in Vietnam are being supplied, and the withdrawal of troops from Vietnam is being supported by this network of computers, and that is what counts.

One can't help wonder, however, at a system that involves a 77-hour computer run for a single inventory cycle, and a duplication of transactions to the tune of two million per month! An evaluation of centralized vs. decentralized data processing in Vietnam might be worth considering.

Another Army computer activity here is the 1460 tape system at Newport Harbor where the Army Milstamp system (military standard transportation and movement procedure) has been implemented by a staff of three CSC programmers, six military and four Vietnamese trainees. They write their programs in autocoder and have designed their own system and forms. This installation is extremely efficient and runs independently of any other computer system in the country.

360/50 System

A second independent Army computer installation is the 360/50 system operated by the 34th Group Aviation Material Management Center, which runs around the clock, seven days a week, just keeping control of and insuring adequate supplies of parts for the Army's helicopter fleet in Vietnam.

Helicopters have made the difference in war operations here, and repair parts have made the difference in helicopter availability. No one wants to guess what the Army would have done without the computer system to maintain control of those parts.

By any criteria, the Army is the largest user of computers in Vietnam, has the greatest variety of systems and capacities, and has experienced the widest range of efficiency. With the largest number of troops, it is only natural it would have the greatest number of computers. It can be expected that its experience with computers at war will lead to even greater efficiency in the future.

As special assistant for users at the Army's data center in Long Binh, Lt. Eldridge Hanes (with pistol) helps the 1st Logistical Command in locating supplies on-hand and replenishing depleted stocks for the III and IV Corps areas. The 'short' sign looms brightly over his head to remind him that he has less than a month before he finishes his tour of duty in Vietnam.

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'Instant Opinions'

Death of a Dream to 'Bring Us Together'

By Phyllis Huggins
CW West Coast Bureau

BEVERLY HILLS, Calif. – A wild dream came to an end on Memorial Day when Yuni Co. (you and I) closed its small office in Beverly Hills, and its two founders faced the loss of more than $36,000 of their own funds. Their dream was to bring the country together through the use of a computerized network which would register "instant opinions" by the public on national issues. These opinions would then be used by a distinguished board of directors who would put their heads together and come up with the solutions.

The two men pointed out that this wasn't such a farfetched dream since computerized networks now exist. One such network, called "world games," is connected to world centers and headed by R. Buckminster Fuller of Southern Illinois University.

Neither of the founders is from the computer community, but they believed the blue-sky prophecizing of some of our leaders that computers will some day be used for citizen opinion polls. They thought the need was so great that it should be done now.

'Two Nobodies'

"We realize that we are two nobodies," said Floyd Bero, formerly an administrative manager with North American Rockwell, "and as nobodies we could do nothing, so we got this plan that if we could get two million cards from people supporting the goals of Yuni, then we could get the attention of the people we proposed for the board of directors."

The directors they had in mind were Walter Cronkite, Bill Cosby, Corita Kent, Thomas J. Watson Jr., John Diebold, William Pickering, R. Buckminster Fuller, Simon Ramo, Norton Siman, and Ricardo Montalban.

To get support, they took out full page ads in a few major newspapers explaining the goals of Yuni. More than 20,000 people responded, many of them solid professional people and even some in the EDP field. The press also responded with full feature coverage of the grandiloquent plan. One radio station even did a special editorial on the company.

Deadline for their plan was Memorial Day when they hoped to take the public response to their proposed board of directors. Instead they announced collapse of their dream. Only three of the people they wanted as directors even responded to their invitation – and then negatively. One of them was Thomas Watson Jr.

This wasn't the dreaming of kids; both Bero and his partner James Andrews are family men. One has four children and the other has six. Andrews was formerly an English professor at Loyola Univeristy. But they quit their jobs because of their belief in Yuni, and now there is nothing to pick up but the pieces.

Roy Bellman
of NCI Chicago tells

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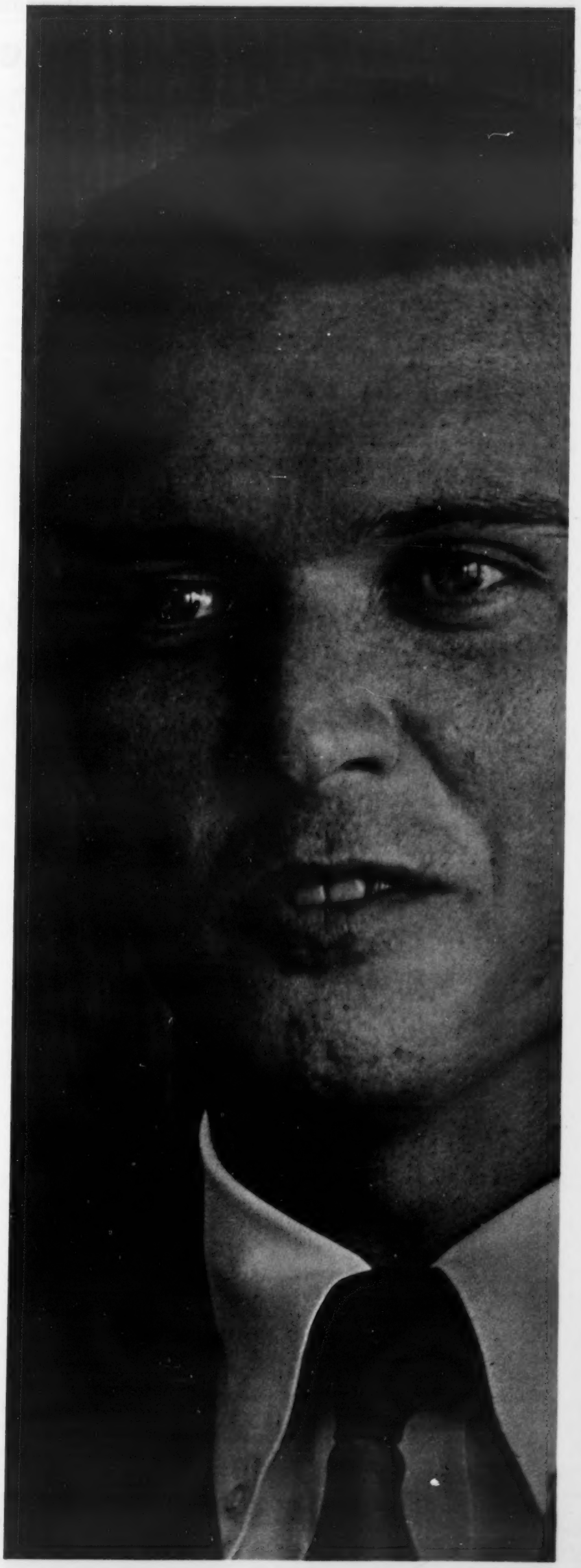

Committee Report Scores Lack of City's DP Planning

By Edward J. Bride
CW Staff Writer

TOLEDO, Ohio – A report by a special municipal steering committee has concluded that every mistake made by the city "in its data processing history" has been caused by procurement "without proper systems study."

The steering committee was formed last year after difficulties in processing police applications caused this city to remove the primary applications from its on-line system [CW, Nov. 19].

The committee's report was submitted by Chairman James B. Daken, who is also administrative assistant to the city manager. Daken said the report represented nearly 1,000 man-hours of committee work.

The study was really a complete analysis of the data processing problems of the city, not just the Police Division.

Included in the recommendations are salary studies, additional personnel, training for existing employees, some hardware changes, and continued monitoring of all procedures.

The steering committee, comprised of a combination of business and city leaders, recommended that such a group be made permanent, so as to provide a forum "to discuss mutual areas of concern."

System Inadequate

The report concluded that the city's present system, a Honeywell H-1200, was not adequate to provide all intended applications with the Police Division's on-line requirements.

Police use of the system for on-line applications like motor vehicle identifications or individual record-checks was curtailed last November.

The report now says that, whereas the hook-up to state and federal on-line programs can continue, the configuration is inadequate to resume the local application.

The system eventually was to provide patrol cars and policemen walking beats with instant criminal and vehicle information. The steering committee report states that new hardware is required before this portion of the city's plan can be implemented.

'Tail Has Wagged the Dog'

The committee report emphasizes that previous problems arose because "increased computer hardware capability has been ordered . . . without proper systems study and design which has resulted in the acquisition of equipment into which a system has to be fitted, rather than designing a system first, then deciding what hardware would satisfy the system. Again, the tail has wagged the dog."

The report calls for extensive studies of the Taxation and Water Divisions' plans for computerization in order to avoid "expensive and predictably unworkable upward changes in hardware."

Daken said that the 33-page report, with 39 pages of appendices, saved the city $20,000, since the committee was comprised of municipal and business volunteers.

The report was prepared "in the rough" in January, and was circulated for comments for several weeks. Submitted February 20, it was made available for publication in May.

Municipal Service Bureau

The committee, according to Daken, agreed on the following summary recommendations.:

- The city should maintain its own, centralized data processing bureau operation.
- The Police Division on-line communications system must be made operational and improved in terms of reliability, flexibility, and capability.
- The other city users of EDP, particularly the Taxation and Water Divisions, are entitled to better performance from EDP in relation to: dollar cost, scheduling deadlines, information processing, and inter-organizational rapport in line with "service bureau" concepts.
- The city of Toledo deserves a computer system that can become an essential tool to management in the day-to-day and long-range decision-making environment of modern government.

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Terminal Shows Court Conviction Record Of Traffic Violator

NEW YORK – Congested criminal courts here will experience considerable relief when computer terminals come into use to assist in sentencing convicted motorists.

When this happens, scheduled for July 1, motorists charged with minor traffic violations will be tried by the state motor vehicle administrative adjudication bureau instead of by criminal courts.

Each hearing officer of the adjudication board will be the equivalent of a judge. Upon receiving a plea (or making a determination) of guilt, the officer will summon the motorist's conviction record onto an IBM 2260 video display terminal in the hearing room.

The terminal will be on line to the motor vehicle department's twin 360/65s in Albany.

A state official said that records could not be called up until the finding of guilt had been determined and transmitted to Albany. Previous convictions will be used to help the hearing officer assign an appropriate sentence.

All source documents are to be maintained on file, in case a driver's previous convictions are challenged.

Only "ordinary" moving violations will be involved in the new procedure, which may be adopted statewide if it works in the city.

More serious violations, like drunken driving, will still be handled by criminal courts, and lesser violations like illegal parking will be handled by the city's new Parking Violations Bureau.

In the hearing rooms, with the officer, clerk, accused and his attorney all present, a "batch" or docket number is listed with the name of the motorist and a description and, if the determination of guilt is reached, that information is also entered on the display and transmitted to Albany.

Seconds later, the driver's record appears in its entirety on the display, including the new conviction.

Emulation Will Cut Capabilities

Communications Big Problem in IBM NS Conversion

By Peter L. Briggs
CW Research Editor

Communications looks like the biggest bottleneck for users converting to IBM's NS series of computers.

The change to NS for communications users will be like the problems of language conversion encountered by users changing to the 360. IBM, learning from the complaints and problems of its users, has presented a solution to language conversion in the form of variable micrologic [CW, May 27].

The communications user, however, has a whole new series of problems to solve, and IBM has not been as able to prepare solutions in advance as it has for languages. Communications conversion is a first-time problem – no previous solutions exist.

Integral Part?

If, as expected, communications becomes an integral part of the central processor, providing faster response, better control, and better error detection and correction capabilities, then the design of communications systems will have to be changed to reflect the absence of such devices as the 2701, 2702, and 2703 communications controllers.

These controllers were peripherals on the 360, and were accessed through the Basic or Queued Telecommunications Access Method (Btam or Qtam). The idea with the 360 was to make communications work like any other I/O system. This approach solved a basic weakness in second generation IBM systems, where communications was usually a tacked-on gadget with limited flexibility and with almost no integration to the existing central processors.

The 360, on the other hand, provided a communications format that was compatible with all the other I/O methods for the operating systems available from IBM.

It has appeared that, though the 360 is the most popular machine for communications processing, users indicate that it is not as well suited to communications as might have been desired.

Communications I/O simply does not behave the same way that tape or disk I/O behave. Special situations become commonplace, each situation requiring direct attention and immediate action if the message is not to be lost.

To provide the necessary response time, and the needed degree of flexibility, IBM in NS appears to have incorporated the logic to handle these situations into the actual CPU. Instead of a peripheral control unit, as in the 360, there is an interface unit in the NS that incorporates the circuitry for the modems (data sets) which has its own group of special interrupts and supervisory routines for message buffering and line control.

It is even possible that IBM will eventually produce communications systems for the NS that use micrologic alterability to process high-speed communications directly, reducing the need for programming and lightening the load of communications system design by about one half.

For the moment, it seems that the communications user will have to provide alternate means of adapting his communications systems to the NS. Variable micrologic will make the NS look exactly like a 360 CPU from the inside but it cannot replace the absent communications controllers. Perhaps IBM will feel it necessary to provide a special attachment for a 2701 or the like that will operate over the NS channel.

This might provide the user with at least a serviceable means of communications compatibility, but it will totally prevent such users from making use of the NS native capabilities for high-speed direct communications.

Design Difficulty

Because of the real difficulty of designing operating systems that provide on-line alternation of the micrologic, it is very unlikely that the NS will permit the simultaneous operation of both an emulating instruction set (peripheral communications) and a native-mode instruction set (integral communications).

Without this simultaneous operation capability, a user will be forced to remain in emulation whenever he runs his communications packages. There will be a conflict between the need to use NS in its native mode – to run faster, have more efficient I/O, and broader instruction sets – and the need to keep communications systems running.

Communications systems tend to require far more design effort, take much longer to write, and are much harder to debug than conventional batch systems or on-line systems that are directly wired to the controllers.

Users cannot invest in programming and design all over again to produce new communications systems quickly. These users will want the lowered cost of NS, the higher ease of maintenance, and the advanced software, but will spend the next few years mostly in emulation, as they have with the 360.

User Pressure

More users went into communications systems, perhaps, than IBM had anticipated. Seventy-five percent of the 360/50, 65, and 75 users are using some form of communications system. The numbers are too large to be ignored, and these users are more prepared than before to fight with IBM over such problems.

IBM itself has taught the user how to define his problems and where the costs really lie – software. Perhaps sufficient pressure can be brought on IBM, by its user groups and by individual users, to effect a change in priorities. IBM should be capable of solving the communications problem.

If it chooses not to do so, the user can only blame the marketing strategies of IBM. The company would rather replace older, longer-installed 360/30s and 40s than recently installed 50s, and 65s. Thus, this large group, a majority of which are communications users, may be forced to wait for NS until late 1972 or early 1973, just because communications has changed again.

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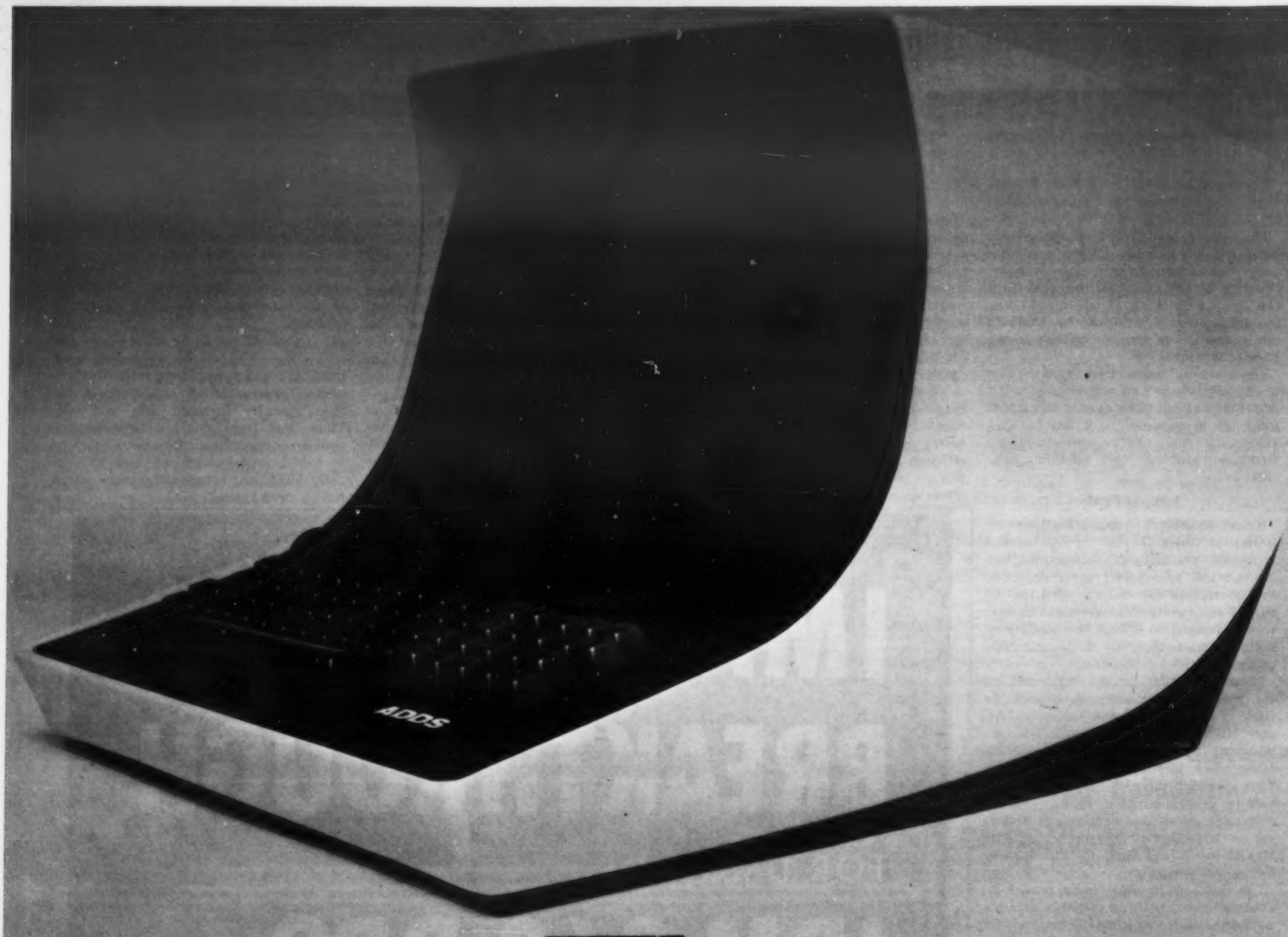

The skin-deep part

The reality of appearance. A computer terminal is truly beautiful only when it combines aesthetics with fine engineering at the right price.

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The keyboard is the same one we use in our portable terminal. It will take a pounding without getting wobbles of the keys.

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Then we put all this together in a snug case that lifts up for easy maintenance, added a plexiglas front panel, and we had our terminal.

In fact, we had three terminals, the Consul 800, the 840 and the 880. They display respectively 16 lines of 32 characters, 16 lines of 64 characters, and 20 lines of 80 characters. They cost respectively $2995, $3495 and $3995. And they are all Teletype® compatible.

A la mode. The Consul will operate in three modes, page, message and conversational. The conversational has a special editing sub-mode. When you move the cursor to correct a mistake, the terminal automatically switches to the sub-mode. After retransmitting the corrected line, the terminal automatically switches back to the conversational mode.

In the message and page modes, you can edit several lines or a whole page of data before transmitting it. In both of these modes a

*Registered trademark of Teletype Corporation

The beauty part

look ahead feature saves transmission time. It scans ahead and if the rest of a line is blank, the cursor goes directly to the next line.

Fill in the blanks. Our terminal also has a formatting feature for fast, efficient data entry. The computer puts up a form, you fill in the blanks with variable data. The tabbing control skips over fixed data and lets you move directly from one variable data field to another. Only variable data is transmitted.

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Editorial

Competition Benefits Users

RCA's announced intention to offer systems support, maintenance, and facilities management to users of all makes of hardware will vastly increase the user's independence. It is not the first company to make this offer, but it is the largest.

In the not-so-good old days, a DP manager had only one alternative – put up with any abuse heaped on him by his hardware vendor or toss out the whole system. Since the latter move was akin to swatting mosquitos with a sledge hammer, most DP managers simply gritted their teeth and put up with the abuse.

But now the DP manager can put heavy pressure on his hardware vendor in the areas of systems support and maintenance. After all, he can now go elsewhere for these services if he doesn't get satisfaction.

Are 10 Heads Better Than One?

Letters to the Editor

Critique and Addendum On the Spett Articles

Some day I expect to find a really perceptive and adequate (from a systems standpoint) discussion of the systems profession. The two-part article by Milton Spett [CW, May 13, 20] is fairly perceptive but totally inadequate because of thoroughly mistaken emphasis in each part.

Part I. A change in one word in the title, and the article, developed accordingly, would make a world of difference. Instead of "It's ability that counts, not how much experience" the truth is that "it's ability that counts, plus how much experience."

Neither ability nor experience alone make a systems analyst. Ability without experience will make a good potential trainee, but ability alone is not enough; neither is experience without analytical ability. Both the inexperienced genius and the inept veteran can render an attempted system inoperable, the first by being unaware of certain essentials required by the nature of the application, the other by relying on background without understanding its purposes.

Both types will be essentially bumblers; the only real difference between the two being that the veteran has had his chance to develop into a systems man and has muffed it because of lack of ability; whereas the inexperienced genius still has a chance if he begins to appreciate that knowledge is necessary.

Mr. Spett's statements in Part I under "Business area experience" are rather dangerous nonsense. A systems man must have some knowledge of the application background to do a good job within a reasonable period of time – whether by specific experience or by comparable experience with applications in some basic way similar.

It is unfair to any systems personnel, however intelligent, etc., to expect avoidance of major errors in system in an area with total absence of background. It is like putting out a student entering mathematics with no background to develop for himself all the basic principles without benefit of textbook or teacher. It is a horrible waste of time.

Part II. Under "Politics," Mr. Spett fails to acknowledge one of the major reasons systems, even good ones, go sour or are even never installed,– absence of any real organization of management system in the business itself.

If the systems analyst is expected to be a politician, the expectation itself acknowledges implicitly that the business itself lacks organization, and that regardless of how good or bad a newly installed system is, it will be pure gravy if it works well. To the extent that the systems analyst's political ability got the system installed and working, the continuation of the system will depend upon the continuity of policy and system in the hands of "the powerful members of the using department" whose friendship he has secured. Changes in personnel in those areas may mean the end of the system.

This kind of situation is the enemy of good systems and good systems men. The systems analyst should be a congenial person who is logical, orderly and a good teacher; but if he is expected to be a politician, his bosses and the company that employs him and them are, by definition, antisystem.

Under such conditions, it is practically pure luck if a good system is installed and lasts for any length of time. With an employer of this type, the system man who wants to preserve his integrity and reputation is better off out the door to a different type of employer as soon as possible.

There may be a slowly growing tendency among businesses to recognize that in order to develop good systems, their organization must be such as to permit and back line authority in the systems organization – that production organizations, whether producing goods to be marketed or internal paperwork, have the responsibility of what to do, and that the systems function is to tell these organizations how to do it.

The rising echelon level of systems function in top management, as a result of its gradually being freed from accounting, controller, financial authority, seems to suggest a more mature viewpoint about what systems analysis and organization mean. There is no longer so much of the "hire one of these bright boys" approach; the term "management consultant" is no longer so awesome, and perhaps has landed permanently in the gag-bag the way "efficiency expert" did a few decades before it.

System is neither a bright young lad nor a magician; it is an orderly, common-sense way of doing things, and a person who is orderly and has common sense can become a good systems analyst if willing to acquire knowledge and experience in the ways of doing things.

Morton D. Bluestone
Data Processing Manager

Township of Woodbridge, N.J.

Reader Professes 'Guilt' Of 'Emotional Reaction'

Having carefully read Charles Collins' letter [CW, May 6], I feel compelled to admit the error of my ways.

I am "guilty" of "emotional reaction" when I read of the deaths of four college students in Ohio.

I am "guilty" of "emotional reaction" when I read of our latest "liberation" action in Indochina.

I am "guilty" of "emotional reaction" when I read of Army data banks of civilian dissenters.

I am "guilty" of "emotional reaction" when I cannot equate the destruction of "private property" used to manufacture napalm and other weapons with the unalterable destruction of life resulting from this manufacture.

In Germany, not too long ago, Collins' "participant who is not a policymaker" did everything that the government requested. If we condemned their moral posture at Nuremberg, how can we embrace it now?

If this is "emotional reaction," I stand unashamedly guilty.

Stan Myers
Systems Analyst

New York, N.Y.

IBM Offers Full Spectrum Of Custom Contract Services

Your April 8 article headlined "Insurance Co., IBM Sign Contract for Total Information System" contained a statement which could mislead your readers about IBM's custom contract services department.

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J. F. Barber
Director of Operations

IBM Custom Contract Services
White Plains, N.Y.

We've All Been Ostriches, Again, So...

Just Where Are the Information Processing Experts?

Almost anything that you can think of has two names – a genuine name that means something, and a Madison Avenue name that sounds nicer, and sometimes means something also. Like rat-catchers and rodent operatives; or caretaker and janitorial personnel. It seems to be a universal modern trend.

Naturally, being thoroughly modern, the computer industry is not satisfied with having two names (the electronic industry, or the computer industry); it also has been quietly pushing for some years at becoming known as the "information processing" industry, which is about as Madison Avenue as you can get.

On the surface it is a good name, too. It means something. In fact, it has just as much meaning as has either of the two older names. Electronics means something, and certainly computer does too, so it does seem to be a good idea to see that the new name also means something.

But below the surface some problems arise with its meaning which would not have arisen if it had taken some almost meaningless phrase, like the brain industry, or data-piping, or some equal fancy. And the main problem is that what it means is different from what the other names for really the same industry mean. And this difference can cause problems.

Electronics, Computers

Factually, the various names for the industry have never been interchangeable. A computer expert does not have to know anything about tantulum capacitors, or how they compare with electrolytic ones. But an electronic expert had better know the detailed comparisons when he is picking out components for mounting on a printed circuit board! Which just goes to show that although computers are certainly made of electronics, a computer expert and an electronic expert are completely different things.

Naturally, there is an overlap between the two. A computer designer is normally an electronic expert who does know quite a bit about how program instructions usually work and about how different needs will tend to create different computer instruction sets. He must be able to understand the programmer's jargon and appreciate the impact of various types of problems upon the system architecture.

The Taylor Report

by Alan Taylor

But does his ability to understand the different types of instructions and facilities required by, say a message system as compared to a management information system, qualify him to take charge of writing an advanced management information system? I don't think it disqualifies him from doing so, but I cannot see that it qualifies him either. He is certainly an expert on how a computer works on a management information system, but his expertise is simply a technical one, not a full expertise. An electronic expertise, but not a computer expertise.

What Does He Know?

A similar situation can be found at the interface of the computer and information processing industries. A programmer, or a systems analyst, can easily be an expert in computers without knowing more than technically what information processing is all about. He can easily, for instance, think that he knows all about a subject such as social security deductions without realizing some of the major characteristics of our current system information-wise.

He will realize, for instance, that the deduction has to be made every pay period, must be printed out on the employee's payslip, and that an equivalent amount must come out of the employer's pocket. But he will remain unconscious of the systematic reinforcement that these actions are designed – and successfully designed – by the real information processing experts who want each worker and each employer to keep thinking of the cost to their pockets that is involved in supporting the old and infirm etc.

The system arranges that they get reminded of this much more often than most of them hear the minister preach the virtues of charity from the pulpit – and with much stronger effect than most clergymen can give their orations either!

Don't tell me that that is not showing a real appreciation of the forces of information processing; yet it is simply not noticed as being such by most computer experts.

Which just goes to show that they are no more necessarily qualified to be information processing experts than an electronics expert is qualified per se to be called a computer expert.

3 Different Disciplines

In fact, the three names accurately reflect the existence of three fundamentally separate disciplines which should not really be confused. An electronic expert is not a computer expert nor an information processing expert, no matter what Madison Avenue names our industry gets called. And if there is one thing the industry is short of, it is information processing experts. I doubt whether we have more than a thousand of them all told.

Afips, IBM New Systems

All of the above was brought on by putting together two pieces of news from recent issues of *Computerworld*. In one, Peter Briggs was forecasting big trouble ahead for users who knew nothing about microprogramming; that, he said, was the basis of IBM's fourth generation systems, which are liable to be on us at any moment. He commented that there were probably less than a thousand knowledgeable people around, and that because of the amount of training required to produce such a person, users would not be able to get their working programmers properly trained.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

In the other article, Afips, whose main claim to fame is its organization of the Spring and Fall Joint Computer Conferences, was described as in some way representing 100,000 information processing personnel.

Now, if all those people were really professional and expert information processors, I am sure that they would not have let their industry be caught with its pants down with this fourth generation.

After all, history records just how horrible the changes were when similar ignorance occurred in the 1950s when the second generation appeared; and in the 1960s with the third generation. Any real information processors would have taken real care to see that it didn't happen again. But, according to Peter's story, and this is being backed up by many sources, it is going to happen again. And the user is going to have to pay the piper.

Real information processors trying to avoid this would have taken effective action to prevent it. They might have mailed out computerized personal letters to us, urging us to check into the Standards Computer's use of microprogramming two or three years ago. Or they might have taken the glossy art work off the front cover of ACM's Communications to feature the president's stinging denouncement of his members for behaving like ostriches and not attending ACM public microprogramming courses. Or perhaps a movement of knowledgeable experts in the universities might have urged banning the marketing of any computer systems where the necessary industry training was not widely available, and utilized.

Or perhaps DPMA, which probably has more actual information processing members than any of the Afips societies, might have taxed its chapter's liquor budgets and hired a top man to keep its membership aware of what it should be preparing for.

Goodness knows what they would have done – but if they had been real information processing experts, they would have used that expertise to prevent their own industry from being shown up as ostriches yet again!

Of course they did nothing of the sort. After all, they are not the Madison Avenue crowd, but "professionals." Computer professionals, I am afraid, and only technically information processing professionals.

If you really want some of those – well I suggest a visit to Madison Avenue ... or Congress ... or TV stations, or somewhere else where they practice information processing as an art. That's where you find the real experts.

Don't delude yourself into thinking that we are the experts. In this area we are just technicians.

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Project and People Control — Part I

Flexible Management Needed to Fit Techniques to Job

By Elliot Raphaelson
Special to Computerworld

It should be obvious that there are different project control requirements for time and materials contracts than there are for any that are fixed in price. Even within the two basic types of contracts there may be wide variances between the types of jobs which are to be controlled.

Same Problems

Many DP managers and DP consulting firms find themselves in serious difficulties each year despite proven technical capability. And many of these problems have arisen because management was unable to control people and projects effectively and deliver an acceptable end product on schedule.

Although this series of articles is specifically aimed at consulting firms, the problems discussed are just as often faced by DP managers in dealing with their personnel and their company management.

This first article covers effective project control techniques for time and materials contracts. Subsequent articles in the three-part series will deal with effective project control techniques for fixed-price contracts, individual control, intermediate and long-range planning.

Management must be flexible enough to vary techniques to fit each job in order to maintain effective control insuring client satisfaction as well as profitability.

Time and materials work falls into two categories:

- Work that is relatively undefined and should be bid only as time and materials or on a cost plus fixed fee arrangement.
- Work that is clearly defined and could be contracted as a fixed price job.

Different approaches to project control are required for each category.

Relatively Undefined

System design in a relatively undefined area would be an example of the first category. The fact that the area is undefined does not mean that schedules do not have to be prepared and monitored.

The important factor in controlling this type of activity is the way in which the system design work is broken down into its basic components. Figure 1 illustrates an example of how a system design job could be broken down.

Each component of the job should be estimated initially, and a preliminary schedule prepared. The client should be made aware that the initial schedule is only an estimate and that changes in schedule are not unusual.

Although it is anticipated that the schedule can change, the initial tasks should be more accurately estimated than the latter tasks in the job. As each task is completed, the subsequent tasks should be reestimated and the complete schedule updated accordingly. Figure 2 illustrates a possible reporting scheme.

Naturally the client should be kept informed as to any schedule modifications. The client may decide to add more manpower, when this is feasible, to insure that an initial target date is met. As unpalatable to the client as it may be, a good consultant may not be very accurate at estimating relatively undefined jobs. In fact, if a consultant has proven to be very accurate, it may be an indication that too much slack time has been built into the initial estimate.

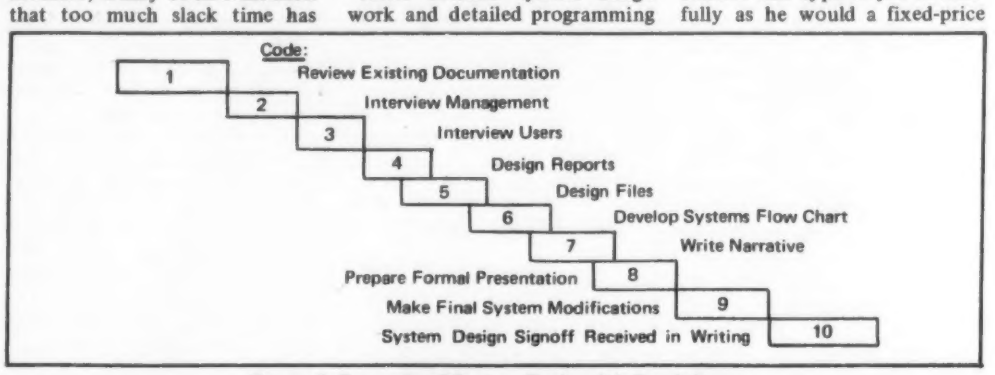


Figure 1. Example of System Design Job Breakdown

A good consultant, however, must have a detailed plan of action, should estimate each task to be accomplished, modify these estimates continually, and keep the client informed as to any estimate modifications, and the reasons for these modifications.

Manpower	
Initial manpower estimate (man-weeks)	4
Manpower expended to date	2
Scheduled manpower expended to date	2
Manpower variances	0
Schedule	
Percent complete	40%
Scheduled percent completion	50%
Current slippage (weeks)	1
Actual start date	1/2/70
Initial scheduled completion date	1/30/70
Revised completion date	2/14/70
Slippage (weeks)	2

Figure 2. Time and Materials Status Report (Weekly) 1/15/70

There is no valid reason for any job to be significantly behind the initial schedule without client knowledge.

Problem Well Defined

After detailed system design work and detailed programming specifications have been completed, the programming task is as well defined as any job will be. This is the type of job that could be and is frequently handled on a fixed-price basis. A time and materials contract makes sense, however, when the client has respect for the consultant, when it is anticipated that significant system modifications can be expected during the job, whether or not the client demands it. The approach to project control should not be different than the approach outlined for undefined time and materials jobs.

Although the approach should not be different, there should be a marked difference in estimating accuracy.

A client should not be dissatisfied if the man-hour estimate related to an unstructured job is off by 30% or 35%. But under normal circumstances a programming estimate should not be off by that kind of percentage on a large job after detailed programming specifications have been developed.

A client should be wary of giving additional work to any consultant who cannot estimate better than that after a programming job has been defined.

Elliot Raphaelson is director of research and development for CGA Computer Associates, Inc.

Facilities Management — Part I

Benefits, Disadvantages Seen From 'Trend of Future'

By Robert W. McGeary
Special to Computerworld

Cut operating costs. Get out of the electronic data processing business — while enjoying a better return on the EDP investment. Free executives from proliferating computer management, operating and personnel problems.

Those are a few of the tangible benefits being projected for facilities management, a controversial new concept under which a company contracts out to a data service organization for its total data processing needs.

Obviously it's not a move to be undertaken lightly. "Farming out" an important segment of a business entails a vast responsibility. If the contractor proves unreliable or folds up, for example, the client company is in serious trouble.

But the thrust for change in electronic data processing is strong, and there's good reason to believe that facilities management will increasingly loom as one of the important "tools" of the 70s. Take the cost consideration. Drawing upon its broader range of experts, the outside firm can perform the data processing functions at less cost than the user.

Secondly, data processing is not the business of the user. The company is in the business of manufacturing auto parts, running an airline, operating a chain of retail stores, or whatever. Data processing is only a tool for achieving the goals of its fundamental business. Just as the company contracts out for industrial catering services, it can now contract out for data processing.

Another major factor is the escalating competition for skills in today's EDP market. The professional data processing service organization is able to attract more of the better qualified people because it can offer them a much broader job development horizon than can any one installation.

Moreover, the real "pros" in data processing are "different": they prefer working in a company that is dedicated solely to their particular field rather than in a company who uses it only as a supporting service to its basic function.

The increasing complexity of today's computer environment also serves to focus interest on the facilities management concept. Both hardware and software require more highly qualified personnel than previously, yet it is becoming more and more difficult for individual installations to attract and keep them.

Advantages

It is important to note that both advantages and disadvantages face the prospective customer for facilities management. On the positive side, he can reasonably expect to reduce the cost of his data processing operation.

Perhaps even more importantly, he can look forward to a data processing operation considerably improved by the acquisition of high-level expertise and personnel who will keep abreast of advances in the computer sciences.

Third, he will be relieved of the "headaches" of running his data processing operation, which becomes a more complex and time-consuming responsibility each year.

Disadvantages

On the negative side, the customer delegates responsibility for this vital function to an outside group. Inevitably, he loses some of the tight control he would enjoy if the operation were kept within the organization.

However, this issue need not be a problem, provided the customer selects the right facilities management contractor, for the responsible facilities management firm should be totally responsive to the needs and requirements of the customer.

Although facilities management is thus meeting a real contemporary need, the number of firms active in the business is relatively small. There is a sound economic reason for this: any organization offering such a service must have substantial personnel and financial resources in order to perform. Its staff must exhibit a high level of expertise and a broad knowledge of data processing problems, across a wide industrial spectrum. Selection of a responsible contractor is thus all important.

What are the key factors in making such a selection? For one thing, the contractor needs to have a clearly high and demonstrable level of expertise within his organization. This is the major product the customer buys. For another, the contractor must be financially stable.

So many chips are being bet on the contractor in this important area that were he to go out of business or even begin to suffer financial difficulties, the customer would be seriously damaged.

Another important checkpoint is responsiveness to the customer and his highly individual needs. Then too, the customer must be convinced that the contractor is using fair methods of pricing.

The options open to the customer within the contractual arrangement will be discussed in the second part of this article.

Robert W. McGeary is president of Lever Data Processing Services, Inc.

Belief in Management Information

Weyerhaeuser One Firm That Turns Talk Into Action

By Robert L. Glass
Special to Computerworld

SEATTLE – There's a lot of talk these days about Management Information Systems using a massive data base.

There's a lot of talk, too, about in-house computer utilities, using centralized computing facilities to service a far-flung network of corporate users.

Last month, the Weyerhaeuser company joined the small but growing list of companies which have turned talk into action.

What is the Weyerhaeuser recipe?

Take four GE-635s. Sprinkle them liberally with communications devices. Stir well, distributing the terminals on a nationwide basis. Blend in a home-nurtured operating system for flavor. Top with intercomputer communication.

The result? An on-the-air, reliability-oriented multicomputing system which on "day one" last month was usable at least 98% of the time.

Corporate Way

Dedicated to management information as a corporate way of life, the internationally known forest products company began several years ago the planning which has led to the current "computing utility" based in Tacoma.

The full multicomputing network, in addition to the 635s, includes six remote GE-115s scattered from Cosmopolis, Wash., to Fitchburg, Mass.; 170 teletypewriters in most areas of the U.S.; and seven Datanet 30s to handle the I/O traffic. An integrated package of applications programs processes orders, inventories, accounting, scheduling, and decision making.

Software for the multicomputing system is a home-nurtured system called Weycos. Weycos is a version of the vendor-supplied package, Gecos, but with extra stress placed on reliability. The overhead for Weycos is roughly 5%-10% higher than that for Gecos, but when a computing utility services a network of nearly 200 remote devices, reliability becomes vital.

Ninety-eight percent reliability – the system utilizes automatic fault detection and recovery – is a system requirement, not just a system goal.

To implement this, "before" and "after" software, journals are maintained on all transactions. In addition, a "synchronization point" including a total memory map is taken every five minutes. The system can retreat to its most recent "synch point" to recover from a fault. Specially modified teletypeweriters are used to monitor system operation on-line.

Home Version

The data base structuring and accessing package, like Weycos, is a home-nurtured version of the vendor software. A prototype of GE's integrated Data Store (IDS) has been modified to serve data management requirements peculiar to Weyerhaeuser.

Even the design of the computer room is innovative. The space is actually a three-floored cube. Computer mainframes, consoles and input tape devices are on the main floor. One floor down, static devices such as disks, and output devices such as printers, are functionally grouped. One floor up are the communications devices. Computer memories and CPUs are kept in a separate room to help control the system environment.

A successful Management Information System these days is theoretically commonplace, but in actuality – rare. One of the key elements of the Weyerhaeuser success story is the belief in data processing and management information at the top level of the company.

Not only does President George H. Weyerhaeuser, chief executive officer since 1966, support the concepts developed in his computing organization, but he has published papers on the subject! "The major payoff of the information system is dealing with future business uncertainties," said one Weyerhaeuser-authored article on industrial management published in 1967.

Another article discussed Weyerhaeuser computer configurations, I/O terminals, and data base concepts as the essential background for a company where "innovation and adaptation to change are not strangers."

Proud of its accomplishments in the computing field, the company has prepared a film depicting the importance of computing in the company's total business picture.

L.W. Herford, manager, computing and telecommunications planning, appears on camera to summarize the Weyerhaeuser system: "I believe the major uniqueness of the computing system at Weyerhaeuser is two-fold: first, it is the largest communications network that is connected to the computer system, and second, the uniqueness of the operating system on which we run."

Weyerhaeuser employs 600 people in computing. They are proud of their low turnover rate (2%), which they attribute to a comprehensive training program.

Plans for the future include taking the multicomputing system of today and modifying it to build a multiwing system, with one 64K memory serving all four processors, and allocation of computer resources being performed automatically within the system.

Experiments with two "wings" have already shown the concept to be feasible. No availability predictions on this system, however, are being made by Weyerhaeuser's computing pragmatists.

Very quietly, in an industry as old as man himself, the loose ends of modern-day, data processing thought are being tied together. The company slogan, "Weyerhaeuser today is a company on the move," may have come from the front office, but its fabrication is taking place in the computer room.

'Procedures' Delay 600 Welfare Checks

BOSTON – A "procedures problem," blamed on the computer as so many human errors are, recently delayed about 600 welfare checks from local public assistance recipients.

The problem involved changes not being recorded properly, or not at all, according to Assistant Welfare Commissioner James J. Colarusso.

Returned to Office

About 450 of the checks were returned to the welfare office because of wrong addresses. Colarusso said that the changes simply "did not get into the system," but that procedures had been set up to assure that the problem does not recur.

The post office does not forward public assistance checks, so these 450 recipients experienced a one-day delay.

The other 150 checks were delayed two or three days because of accounting procedures. Emergency payments, advances, reductions because of changes in eligibility, and other changes were not made to the records of about 200 recipients, so the checks were held up.

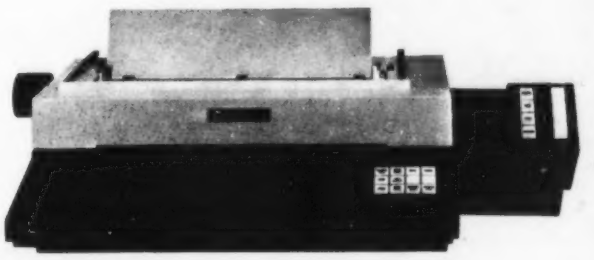
"Computer Holds Up Welfare Checks" is how the Boston *Record-American* reported the situation. But Colarusso indicated that it was really the human element that caused the delays.

He also said that he had taken steps to assure that all changes would be entered automatically, instead of manually as occurred in this case.

Attempts to Maximize

The problems ultimately arose from attempts to maximize the computer, an IBM 360/30, which Colarusso said had been used "as a printing machine to print the checks."

He said that the situation is now almost cleared up, with last-minute changes, emergencies, and varying cut-off dates the only remaining problems.



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Early Discovery Cure Rate 80%

Prompt Dosimetry Calculations Aid Cancer Patients

TULSA, Okla. – The opportunities for computers in medicine are almost limitless, according to a doctor at St. Francis Hospital here who is using a computer as an aid in the treatment of cancer.

Dr. Theodore J. Brickner, a therapeutic radiologist, said the computer was eliminating guesswork in the treatment of cancer, and, with the benefits of early diagnosis, gave victims a better chance for survival. The cure rate, he said, had risen to about 80%-90% in cases where the disease had been discovered in its early stages.

American Airlines currently provides its 360/65 on a lease-time basis. The hospital is negotiating for the purchase of its own computer, Brickner said.

He explained that physicians tackle cancer with combinations of surgery, drugs, and radium. The treatment has to be applied cautiously so that healthy tissue will not be eliminated as well as the cancer.

Dosimetry

The computer is used in such cases to perform calculations of dosimetry, that is, the amount of radiation that comes to a given point from radium placed in a certain area of the body. The radium, which gives off energetic gamma rays, is implanted in the diseased area by means of needles that resemble small nails.

Knowledge about the correct amount of exposure is necessary so that the doctor can place the radium pins in strategic positions to kill the cancer, and not the healthy tissue.

With the computer program, the machine can tell in a few seconds the amount of exposure at 2,200 points surrounding the radium. Without the computer analysis, it would take several hours of calculations from a ready-made reference table to determine exposure at five to 10 locations, Brickner said.

Hard-to-Treat

The program is used for hard-to-treat areas of the body such as the cervix, uterus, cheek, tongue, mouth, and neck. Radium implantation is used in other treatment methods, but it is the only approach that allows a high concentration of radiation in a small, inaccessible area.

The computer works from X-rays of the patient, with dummy implants, that have been translated into computer language. It analyzes the exposure to the radiation in three-dimensional space and produces several feet of printout with statistical answers.

Doctor's Decision

The computer does not suggest alternatives to placement of the radium sources, but instead, interprets the situation as presented. The doctor makes the final decision about the location of the implant.

Brickner said that the program first went into operation in March.

He emphasized that many similar computer programs for the treatment of cancer were in operation in other parts of the U.S.

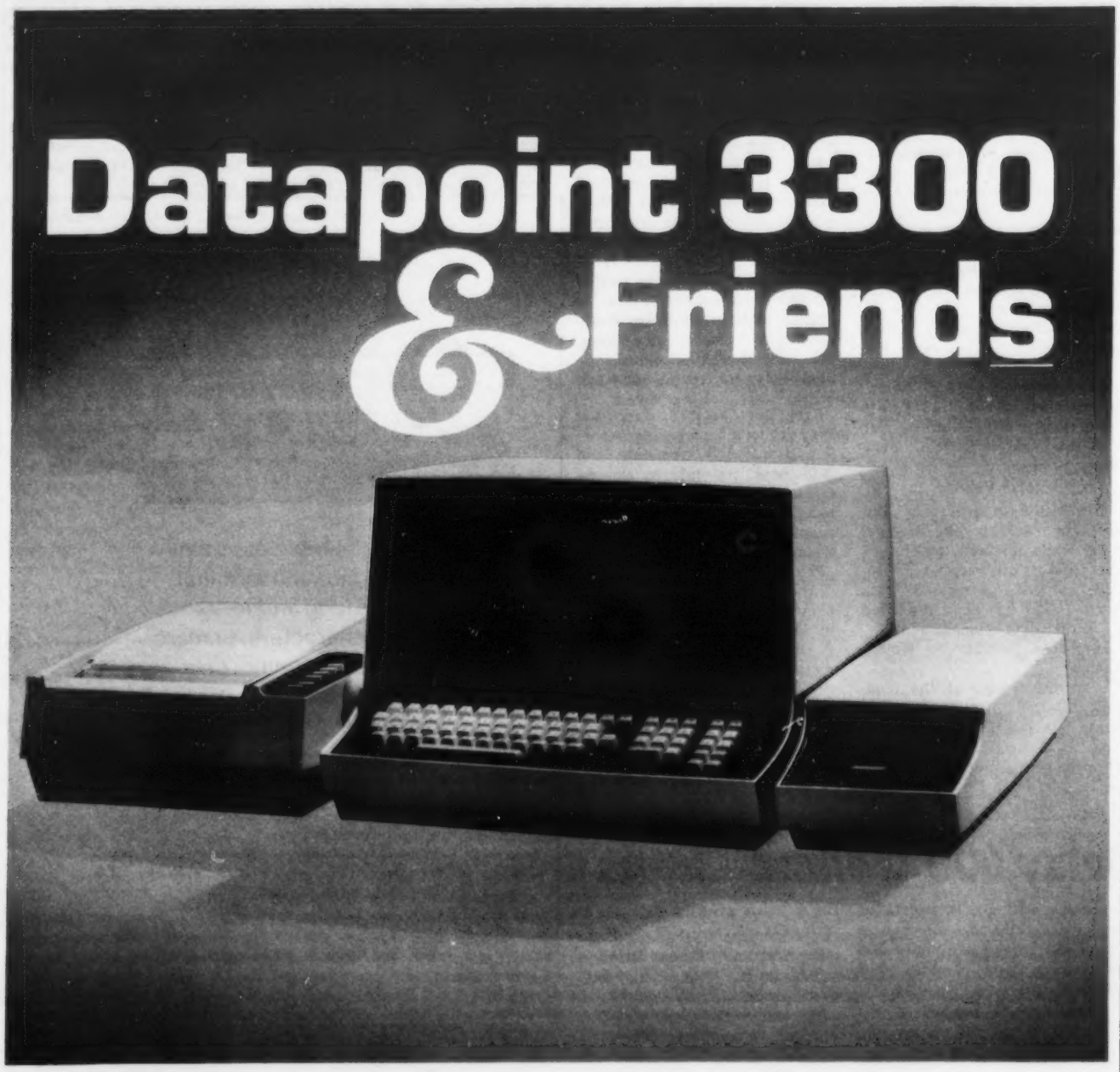
The St. Francis Hospital program is unique, he said, in that it has been brought from the experimental stage in the medical schools and made to work in a small hospital without any federal funding, or aid from any other organization.

This experience, he said, demonstrates that computerization of many hospital and medical functions could be accomplished at a negligible cost.

Crime Is Expensive

SAN DIEGO, Calif. – San Diego has completed a three-year development of a computer-based police information system which has cost $1.5 million in city funds.

The city is planning to enter a new and more sophisticated phase in its command and control computerized network which, to be fully implemented, will cost another $3.7 million over the next three years.



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The 3300P features print speeds up to 30 characters per second • accepts incoming data at 110, 150, 220 or 300 BPS • serves up to five Datapoint 3300's • formatted report preparation • thermal printing process • plug-in utilization • light weight • compact • handsome styling • easy maintenance (fewer than 25 moving parts).

Just as important, the 3300P is available now, currently in many field installations in fact, as are the Datapoint 3300 and the 3300T. You can find out more about the new 3300P and the whole Datapoint family by contacting any of the Computer Terminal Corporation offices listed below.

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Health Test Centers May Cut Patient-to-Doctor Ratio

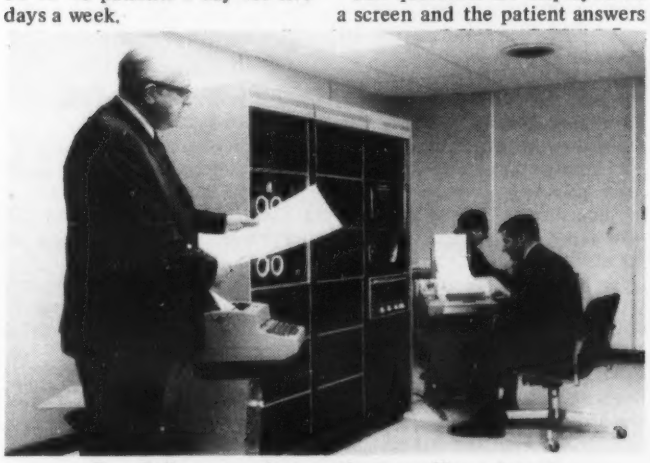
By Peter F. Carr
CW Staff Writer

WASHINGTON, D.C. – Computerized medical centers will revolutionize medicine by caring for the healthy segment of the population with preventative checkups, and allowing the physician more time to treat the sick, according to a Washington physician.

Computerized health testing centers will also help to alleviate the heavy patient-to-doctor ratio, said Dr. Joseph Bailey, who heads a computerized health laboratory. At present, this ratio is changing rapidly with demands for medical service growing at a faster rate than the number of physicians available.

The data collection and processing equipment Bailey uses in his computerized laboratory is leased from Health Auto-Data, Inc., a subsidiary of Quanta Systems Corp., of Rockville, Md.

With the help of the computerized center and a staff of seven assistants, Bailey can now handle 30 to 40 patients a day for five days a week.



Dr. Bailey examines patient profile printout.

Each person who comes to the center fills out a short identification card which is programmed by number into the DEC PDP-8 computer. Then he begins the series of tests which go directly to the computer or are entered by a medical assistant.

The first of these involves a mechanical "history-taker" which asks a total of 320 questions covering every conceivable facet of the patient's social, psychiatric, and medical history.

Profile-320 automated medical "history taker."

The questions are displayed on a screen and the patient answers by selecting a displayed response and pushing the appropriate button.

Bailey points out that one of the main advantages of this test is that it is thorough. A doctor usually does not have time to ask a patient the large number of questions necessary for a thorough screening.

In addition, patients are less reluctant to answer intimate questions from a machine than from another person, he said.

The tests can be administered in a number of different languages and contain personalized notes to the patient to put him at his ease and to encourage more forthright responses.

When he is finished with the "history-taker," the patient moves on to the other machines. An aide accompanies him, carrying an identification card to each machine. When placed in the computer terminal slot, the card directs the computer to identify and record the information.

Electrocardiogram

An electrocardiogram is taken in five seconds by means of a device that is attached to the body at 12 different points.

Chest X-rays are taken on rolls of film, and a blood sample is run through 12 different tests. Other tests include blood pressure, pulse, vision, hearing, urinalysis, pap smear, and lung tests.

Bailey said that the computerized testing method had two obvious advantages. By screening a large number of patients the healthy ones can be screened out immediately, so that the doctor only has to deal with the ones who are ill. Secondly, when the patient is ill, the tests eliminate all the usual time-consuming preliminary work.

The patient does not see the doctor until the screening process has taken place, but the doctor examines each patient's printout to diagnose his illness and to recommend medication or surgery.

Bailey does not expect that the computerized medical center will eliminate the need for the family doctor, since a person can use the laboratory's diagnostic services for reasons of time and cost, while retaining his own doctor for treatment.

The cost to the patient for the complete examination amounts to less than $100, Bailey said. This figure is expected to be reduced as the volume of patients increases.

Computer Helps Architects Design For Clients With Limited Budgets

ST. PAUL, Minn. – A small computer is helping Ellerbe Architects design much-needed hospitals and medical buildings for communities and institutions with limited budgets.

Ellerbe's IBM 1130 computing system provides close control over complex designs for hospitals, medical schools, clinics, civic centers, educational facilities, and industrial and office buildings.

Wayne Winsor, firm president, said: "The computer lets us handle a large volume of work, write more competent building specifications and more efficiently designed electrical, structural, and mechanical engineering elements in a building.

"This is particularly important now, as the architectural profession confronts a severe shortage of people."

Computer techniques also assist Ellerbe in specification writing. In a typical hospital project, for example, there may be 3,000 different specification decisions made from 15,000 possibilities.

A draft specification can be selected in two hours on the computer. Previously it took an individual more than 24 hours to manually make the same selections. The total time spent by a specification writer in manual preparation is cut in half when the computer is used.

Ellerbe is also using the computer:

- To determine fire exit requirements for hospitals. A designer working without computer help needs about two days to produce such an exit plan.
- To plan the structural design of buildings in either concrete or steel.
- To design air handling systems and select mechanical equipment for large buildings.
- To aid in design of seating arrangements for auditoriums for optimum visibility and capacity.
- To track project cost and progress for clients through to completion. The architect can pinpoint each stage of construction, giving deadlines for critical phases on which still other critical phases depend.

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One System Fulfills City's Government, School Needs

DANBURY, Conn. – City of Danbury officials have found that a single computer system can be effectively used to fill the requirements of both the local school system and government.

For example, while the school system receives a detailed cost and profit, and loss breakdown on 13 cafeterias every month, the city is updating personal property inventories, maintaining complete histories on each piece of machinery operated by the Department of Public Works.

By consolidating functions like these into an integrated operation, a city Danbury's size – 48,000 people – can justify its own computer, in this case a Sperry Rand Univac 9200 punched card system.

"Alone, neither the city nor the schools could have installed its own computer. Instead, we probably would have expanded the use of data centers and our own mechanical bookkeeping and tabulating systems. At best, we would have shared facilities with other municipalities in Connecticut, but they could not have fulfilled Danbury's requirements," according to John P. Edwards, city comptroller.

Under the present system, responsibility for all accounting is assumed by the comptroller, as directed by the city charter. By using the computer, officials can bring together the many little facets of operating the city and a 12,000-student school system, and thereby give them direction, he said.

For instance, though the school system operates 13 cafeterias and does $500,000 annually in business, a full year went by before anyone could determine whether they were within budget or losing money. There were just too many items for the cafeteria director and her one assistant to tabulate on a regular basis, he continued.

"With the computer, however, we furnish the cafeteria director with a monthly report showing her costs and 'profit' and loss for each of the 13 facilities. The listing also indicated the 'profit' for the various types of food sold," Edwards said.

In the Public Works Department, a history of operating costs is being compiled on a month-to-month basis for 40 trucks, cranes, bulldozers, and other equipment.

It also analyzes equipment efficiency, pointing out, for example, when a truck has required three clutches in a year so that the cause can be determined, he said.

"Neither one of these applications nor most of the 50 computer programs 'on the air' at this writing is considered major, such as tax billing. As intended from the outset, our objective has been to program jobs that need immediate attention," he said.

Frank A. Mastriani, data processing manager, fans a deck of punched cards before entering them into the Univac 9200 computer operated by the city of Danbury for both municipal and school affairs.

"Because we have our own computer and, therefore, could establish priorities to meet existing conditions, we first attacked trouble areas where there was no other way of doing the jobs," he continued.

The computer is built around punched card processing. Master records are stored on punched cards. All data entered into the system is also through punched cards.

Four digit master codes separate the school from the city accounts. The numbering systems are the same, and eventually could be linked, but certain digits differentiate the accounts. The school board accounts also are compatible with the U.S. Office of Education's reporting system for comparison purposes.

"Wherever a record-keeping procedure existed before, manual or mechanical systems have been replaced by the computer. Where there were no regular reports, city and school administrators are being furnished with timely information that previously was unavailable, or, at best, was furnished on a somewhat less dynamic basis," Edwards said.

"For example, 23 special operating funds, such as one for the junior high school, were maintained manually and updated just once in six months.

Though small, these accounts have been incorporated into the computer system, reported, and reviewed monthly. Together, they are processed and reports printed by the computer in 30 minutes," he continued.

"Eventually, the bread-and-butter tax and payroll applications will be added to the system, probably in 1970. Other jobs also will take their place in the scheme of things," he said.

"But, we have only embarked on the first of a three-phase program that will take us to a larger computer, the Univac 9300, and then to magnetic tape and disk storage. The school system already is thinking of installing data communications terminals, which will link it directly to the central computer. Also, the computer will be made available shortly to the schools for teaching purposes," Edwards said.

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Data System Simulates Flight Wear To Help Predict Airframe Failures

TULSA, Okla. – A computer "flies" a grounded U.S. Air Force B-66 jet to keep other such planes in service longer.

The developer, McDonnell Douglas Corp., said the computerized test system could mean a longer and safer life for any aircraft by helping predict airframe failures in time to incorporate preventative measures in service aircraft.

Engineers are using a computer in the control system to simulate the wear and strain of an actual flight on a B-66 taken from duty, stripped of landing gear and engines, and attached to the test floor here.

In one hour the computer simulates the equivalent of 62 actual flight hours, or about 20 combat or training missions.

In a typical simulation of a pullout maneuver, for example, the IBM 1800 data acquisition and control system took into account the interaction of pressures on different sections of the wing. In a 3-g pullout (three times the force of gravity), the computer directs 38 jacks to exert varied forces ranging from 12 pounds at one point to more than 22,000 pounds at another.

E.M. Barnes, director of engineering for the Tulsa Division of McDonnell Douglas, said findings so far indicate the twin-jet, swept-wing B-66 can remain in use about twice as long as expected, with only minor modification. Results of the computer-operated tests will be used to extend the aircraft safe-life to approximately 15,000 hours.

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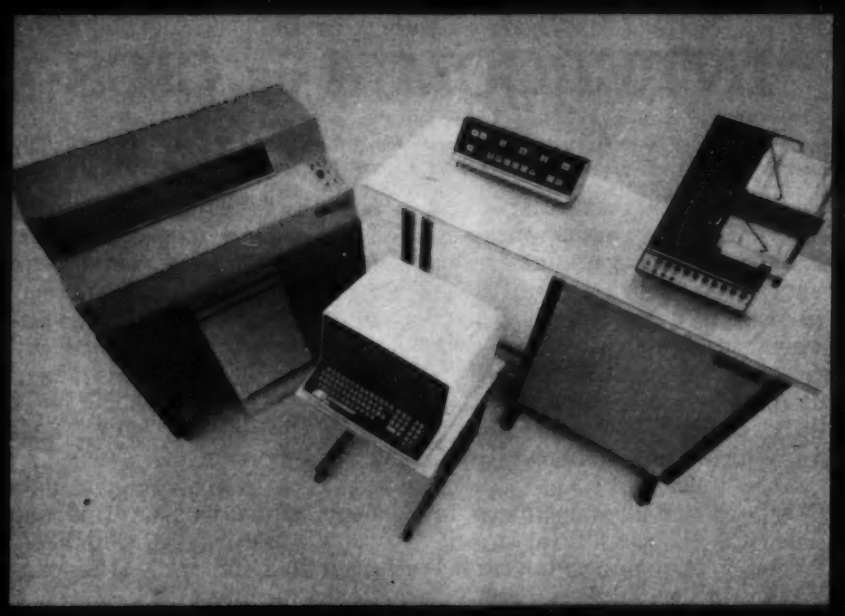

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Hard Facts About Communications Software:

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Why? Because for one thing INTERCOMM supports applications written in any language, including COBOL, FORTRAN, PL/I, and BAL.

CICS allows BAL modules only.

Second thing: INTERCOMM lets utilities simplify the efforts of the application programmer. The Edit and Output utilities automatically edit and format messages passing back and forth from the terminal to the applications programs. The Display and Maintenance utilities permit the display and modification of any fields within a file.

CICS provides no similar utility capability.

Third thing: INTERCOMM completely separates the BTAM or QTAM interface logic from the user program.

CICS requires that the user include the TP macros as part of each of his application programs.

Fourth thing: INTERCOMM is available for both the DOS and OS users with complete upward compatibility to OS.

CICS is an OS system only.

Fifth thing: INTERCOMM takes most of the work away from the application programmer. Like providing complete control logic and central file handling...optimizing the OS/DOS facilities.

With CICS, the user must develop his own controller logic using the CICS macro language.

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Address_____

City_____ State_____ Zip_____

System/360: 40 ☐ 50 ☐ 65 ☐ Other ☐

Operating System: DOS ☐ OS ☐

Programming Methods

Subsidiary of Sylvania Information Systems

Cipher/1 Designed for Assurance of Total File Privacy

By Don Leavitt
CW Staff Writer

WILMINGTON, Mass. – The privacy of proprietary data files can be assured even when the files are out of the owner's physical control by using Cipher/1, a security package that uses cryptographic techniques. The package is ready to use on 360 systems and costs less than $500.

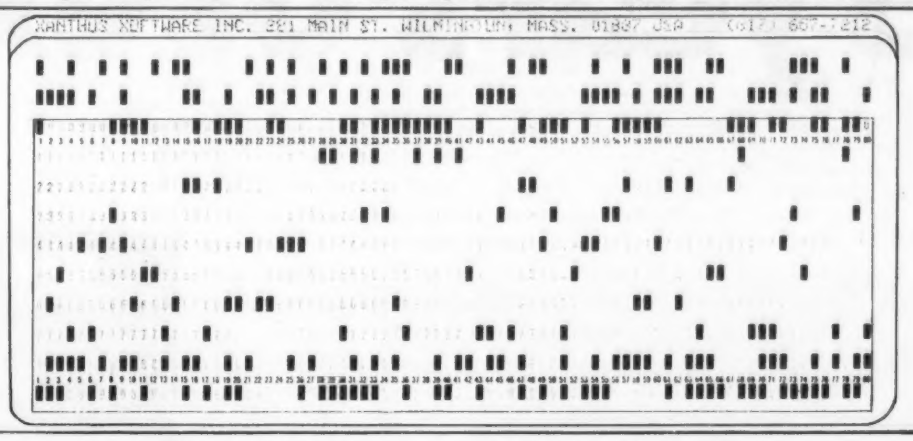
According to the developer, Xanthos Xoftware, the possibility of theft or unauthorized use of proprietary data is being aggravated by the use of data transmission, not only over common carrier lines, but also through the mails, in the form of cards, tapes, and disks. Time sharing and other outside machine rentals often mean that data cannot be protected in conventional ways, the company said.

With Cipher/1, data can be encoded into a form which unauthorized persons will not be able to decipher. Xanthos said that the enciphering is done as part of the program that creates the data. Only programs using the matching deciphering techniques will be able to use the data.

The company said that each file can be made unique by use of a password so that even people with access to the programs can't decipher it unless they have the password used with that file when it was encoded.

Cipher/1 is able to handle any type of data, in any coding structure, Xanthos said, and there is no limit on the size of records, or files, being protected. Data may be fixed or variable length, and may be organized as files, streams, messages, lists, or any other form required, the company said.

The only restriction on data, according to the company, is that all 256 bit structures must be valid for the device involved. This would only be a problem for certain types of telecommunications equipment that reserve some codes as control characters. A limitation on file structure lies in the fact that truly unbreakable cryptographic techniques require sequential, and not random enciphering, the firm said.



"HELP FOR USERS" was the password used in this example.

Mail Order Module

Cipher/1 is described by Xanthos as a "mail order module." Precompiled and pretested, it performs only the cipher/decipher function. The CALL statement of higher-level languages can be used to access the coding and specify the password. A special macro instruction is provided for Assembler language programmers.

The company said the same module and calling sequence, or macro instruction is used for both ciphering and deciphering.

The module is called before writing an output file to encipher the data, and after reading an input file to decipher it.

Although the password normally triggers the ciphering, the special password "plaintext" has been provided as a debugging aid for new programs. Xanthos said that this password causes no ciphering to take place.

Version of Vernam

The technique used by Cipher/1 is a computerized version of the Vernam "one time tape" system, described as the most secure cryptosystem yet invented. Xanthos said that there is no published method for breaking this type of system. The technique is based on polyalphabetic substitution with randomly chosen alphabets.

Each character of text is ciphered with a different alphabet, and these are never repeated. In EDP terms, this means that a different, randomly chosen coding structure is used for each byte of data.

Use of the EXCLUSIVE OR in the Cipher/1 module demands the use of the same password for both ciphering and deciphering. In fact, Xanthos said, there really isn't "ciphering" and "deciphering" but only one function, a reversal of the bit structure as given, based on a key, which in turn is based on the password.

The alphabets, or coding structures, are produced by random number generators. Cipher/1 uses the password to initialize the generators so that each password produces a different series of alphabets, thus making the cipher unique for that password.

Each copy of Cipher/1 is provided with certain changes to the random number generators. According to the company, this means that no two copies of the module cipher is exactly the same manner, even when given the same password.

Cipher/1 is able to process about 23,000 eighty character records per minute on a 360/30, but, the company said, this time will be buried under I/O in many programs, resulting in almost no additional machine usage. Xanthos also said that with Cipher/1, there is no need to cipher the entire record or file, if only certain fields are considered confidential. Partial ciphering would speed the processing time, the company added.

The module is written in Assembler language for coding efficiency and is operational on the S/360. Cipher/1 requires 500 bytes for the actual coding and an additional 880 bytes of working storage.

The package is available for $495. The company provides programmer's training and reference material, along with sample programs in Cobol, Fortran, PL/1 and Assembler language. Xanthos said that the module can usually be implemented by the user working with the documentation provided.

Xanthos Xoftware Inc. is at 281 Main St.

360 Users Get Package To Monitor Tape Status

NEW YORK – IBM 360 users are now provided with a software system that monitors the status of every tape in their library, according to the developer, Mnemotech Computer Systems.

The company said that in addition to monitoring usage of the tapes, the package produces reports, generally on a daily basis, of actual, physical use of tapes with warning flags on those that the software system considers ready for cleaning or resurfacing. Other reports show the availability of new and scratched tapes, and the status of tapes being held in the library. If desired, competitive tape life characteristics by vendor can also be monitored, the company said.

Mnemotech said that the monitoring portion of the package is core-resident and requires 8K of memory. The system can be used on 360/25s and up.

Available now, the package costs $1900 including on-site installation help from Mnemotech personnel. The company said that users can expect installation to take two or three days.

Mnemotech Computer Systems, Inc. is at 55 Liberty St.

APS Allows Vendor-Payment Control

BURLINGTON, Mass. – Managers with 32K 360s who require complete control over vendor payments, discounts, and cash commitments, can use the Accounts Payable System (APS) developed by Manufacturing Management Sciences (MMS).

MMS said that APS is designed to give complete pre-payment information on vouchers by discount date, and by vendor (if required). Because cash commitments are defined prior to check writing and vouchers can be paid on a selective basis, APS provides complete control over discounts, MMS said.

Other advantages of APS include maintenance of a complete vendor status and history file, and automatic check reconciliation.

Voucher File

In addition to the vendor file, APS is based on a voucher file and a date file. With this data base, the system is said to produce more than a dozen major reports including a vendor file maintenance register, a new commitment journal, and cash commitments separated by period, date and vendor. Others are payments by date and by vendor, checks, check register, and check reconciliation listing, along with a paid voucher report. Various month-end and year-end reports are also produced, the company said.

MMS said that APS uses a bill-of-materials type of processor to gain random access capabilities. The current version of APS is written in PL/1; however, a Cobol version is being developed.

The system is geared to 360 users with 32K and at least two 2311 disk drives, under either DOS or OS/360.

$10,000

Available now for $10,000, in most cases APS can be completely installed in a period of from one to four months, MMS said. Installation includes full documentation, the company said, and an average of 10 days of on-site assistance during the installation period, to complete the program modifications and other tailoring that may be required.

A technical survey, at no charge, will be made to establish the exact amount of assistance needed, a company spokesman said.

Manufacturing Management Sciences Inc. is at 279 Cambridge St.

File System Stores User-Designed Data

WESTPORT, Conn. – Sysfile, a general purpose file management system available from Hygain Technologies, can be used to store and maintain data in variable length formats of the user's own design, and to index the data for future reference.

The user can search the file for key words and retrieve data according to various logical and/or relevant factors.

The system can be used to prepare two-dimensional analytical reports, the company said.

Consisting of a library of 12 modular programs, Sysfile is open-ended to permit modifications and additions by the user's programmers.

Developed by Michigan State University, Sysfile is described as being both machine and application independent.

Written in Usasi Fortran, Sysfile has been implemented on 360/40 and higher, including the 67; CDC 3300/3600, 6500/6600; RCA Spectra 70/46; GE 635; and XDS Sigma 7.

On the 360, the system requires 110K bytes of main storage and two million characters of auxiliary storage, either on tape or disk. This does not include the data base, which may also be stored on either tape or disk, Hygain said.

The system is available on a lease basis, for a minimum period of 18 months at $280/mo, including maintenance. Hygain said that Sysfile is also available on a perpetual-use basis for a one-time charge of $5,900 plus a $59/mo maintenance charge.

Sysfile is part of Sysmart, Hygain's library of program packages. Hygain said that the library helps users to budget their computer costs by accounting for each job as it is completed.

Hygain Technologies Inc. is at 65 Whitney Street.

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Mag Tape Data Base Provided Daily on Stocks, Bonds

NEW YORK – A financial service which provides a data base of price, volume, earnings, dividends, and related information on more than 7,000 stocks and bonds can be obtained daily on magnetic tape from its developer, Telstat Systems Inc.

Called Telprice/70, the service covers all securities listed on the New York, American, National, Midwest, Pacific Coast, Montreal, and Toronto Stock Exchanges.

In addition, Telstat said 1,400 industrials in the over-the-counter market, including marginable stocks, are covered, as are bank, trust company, and insurance stocks. Daily bid-and-asked rundowns on mutual funds can also be provided, the company said.

Telstat said that, for listed stocks and bonds, Telprice/70 provides daily high-low-close-volume information. For over-the-counter securities, it furnishes daily bid-asked, average data.

The service also provides earnings per share, shares outstanding, complete dividend information, rights and warrants data, and specialized bond information, the company said.

Updated tapes, available in 7- or 9-track form, and in BCD or binary, are normally sent to subscribers on a daily basis and picked up 10 days later. The company also expects to provide back-up tapes and telephone consultation on a 24-hour basis.

Telstat said that although software packages to use the Telprice/70 information are in development, the service is presently limited to providing the data base, which users can manipulate to meet their own needs.

Subscription price for the Telprice/70 service is in the $600 to $1,000/mo range, depending on the amount of information required and the frequency of the updates. The company noted that, even though most subscribers are expected to use the daily service, others may need only weekly or monthly updating.

Telstat Systems Inc. is at 150 East 58th St.

T/S Package Gives Financial Forecasts

LOS ANGELES – Users will now be able to conduct extensive analysis of their own financial operations from keyboard terminals, by utilizing a new package available on the Infonet time-sharing network, according to Computer Sciences Corp. (CSC), operator of Infonet.

Developed initially by The Northern Trust Co., Chicago, the package allows a user to rapidly develop short- and long-term financial forecasts based on multiple assumptions, CSC said. Working in conversational Basic, users can prepare contingent plans for changes in economic conditions, market demand, interest rates, and other factors.

With the package, CSC said, users can evaluate the effect of changing economic conditions on the profitability of investments in capital equipment and business enterprises; or compare the advantages of financing capital equipment by leasing, borrowing, or buying.

Access to the Infonet time-sharing network, including the financial packages, is available for $50 with a minimum charge of $25/mo. Basic charges are $11/hr for terminal connect-time, $.50/sec for conversational CPU time, and $1/page/mo for file storage. On the Infonet system, a page of storage is 3,027 characters.

Computer Sciences Corp. is in Century City.

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Fortune 500 Statistics Available in Data Base Form

NEW YORK – A data base comprising 15 years of vital statistics concerning the 500 largest industrial firms in the U.S. is now available on magnetic tape from *Fortune Magazine*, which compiles the Fortune 500 directory. The Fortune 500 data bank is also available through a number of time-sharing services, the magazine said.

Statistics provided by the company include sales rank in year, assets, invested capital, number of employees, net income, income as a percentage of other factors, earnings per share and growth rate in last 10 years. The data is to be updated as each new Fortune 500 directory appears.

Several time-sharing services indicated they are developing packages to access and interpret the data base.

Tymshare Inc., Palo Alto, Calif., said it is working on a simple program to access the information. Results obtained may be used as input to existing library programs for analysis under the user's control, a spokesman said.

Data Network, in New York, said a library package of stepwise multiple-regression programs to make predictions and perform turned analysis from the data will be available in mid-June.

Realtime Systems, New York, said it is also working on a set of analysis programs.

The Fortune 500 data bank should be useful to operations researchers and financial analysts, said Comp/Utility Inc., Boston, which expects interest in the information from government and university sources.

Other time-sharing services through which the data bank is available include Princeton Time Sharing Services Inc., Princeton, N.J., and Allen-Babcock Computing, Inc., Los Angeles.

The magnetic tape version of the data bank is available directly from Fortune for $1000/yr which includes updating. Price of the time-sharing versions will depend on specific applications.

Fortune Magazine is in Rockefeller Center, N.Y.

'Pal' Controls Computerized Drafting

CHAMPAIGN, Ill. – A proprietary software package called Pal (Precision Artwork Language) is available from Automated Graphic Technology, for graphic applications.

Pal is a language which facilitates the transformation of precision artwork requirements into a set of commands suitable for controlling an automatic drafting system, according to the company.

The package serves as a "translator" to automate drafting at the draftsman's level and to provide the draftsman with a way to communicate in a natural mode to the computer and automatic drafting plotter.

Pal, designed to accept data from various analysis programs, is a universal language for generating precision graphics for printed circuit boards and integrated circuit devices, chemically etched parts, comparator charts for inspecting precision parts, aerospace lofting, mapping, patternmaking, and general engineering drawings.

Implemented for the Honeywell DDP-116, CDC 6500, GE 635, DEC PDP-15, IBM 7094 and 360 digital computers, the program can generate output for any automatic drafting machine, the company said.

The price for Pal ranges between $5,000 and $7,500 depending on the options desired.

The company is at 107 North Elm St.

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Lancaster, Ohio 43130
February 9, 1970

Mr. Robert P. Wolk
Vice President-Marketing
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	RPG	COBOL	SCORE
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Keypunching	4.1	7.3	.5
Computer Time	1.9	1.7	1.0
TOTAL HOURS	17.8	31.8	5.5

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M. L. Weil

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Director, Management Information Services

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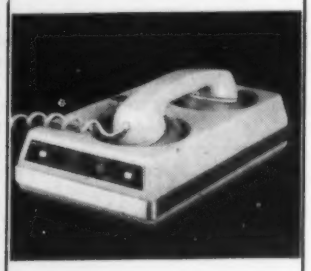

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Software/Services Roundup

N/C Unit PDP-8 Compatible

REDONDO BEACH, Calif. – United Computing Corp. has developed an APT numerical control (N/C) processor system which can be loaded and processed without modification by the Digital Equipment Corp.'s PDP-8, according to the firm.

The system, called Uniapt, is said to reduce to approximately $40,000 the price of the computing system required to run the APT program.

The Uniapt system handles all part programming functions for numerical control tools up to, but not including, 5-axis. It provides the capabilities needed to accomplish both two- and three-dimensional part contouring.

The unit is available in two sizes. The prices, $44,980 for the small system and $77,380 for the large, include hardware, software, documentation, and system support. Small systems can be leased for $150/mo and large systems for $365/mo. There is an additional charge for maintenance of hardware.

The delivery schedule is four to six months.

United Computing Corp. is at 802 Torrance Blvd.

Delta Data Expands Installation Service

WASHINGTON, D.C. – Delta Data Systems has expanded its training and installation service to service bureaus that purchase its proprietary accounting systems. The service is available at no additional cost.

The company has also formed a Bank Services Group, composed of banking specialists, which will provide a variety of services to the nation's banking community.

The Bank Services Group will operate within Delta's Facility Management Division.

Delta Data Systems is at 9903 Rhode Island Ave., College Park, Md.

CUI T/S Service Expands

ROCHESTER, N.Y. – Computers Unlimited, Inc. (CUI) has extended the time allotted its time-sharing customers from 8 to 11 hours each day.

In related moves, CUI is installing dedicated telephone lines to connect customers in Buffalo with its computer center here.

Further plans include dedicated lines for CUI customers in the Binghamton and Syracuse areas.

Computers Unlimited, Inc. is at 540 Main St. E.

Retrieval System Can Be Installed on All IBM Series

NEW YORK – A modularly designed file management and information retrieval system, Info/I, has been produced by PDA Systems, Inc. Info/I can be installed on any IBM series computer under DOS or OS with a minimum core size of 32K.

PDA Systems, Inc. is at 12 E. 86th St.

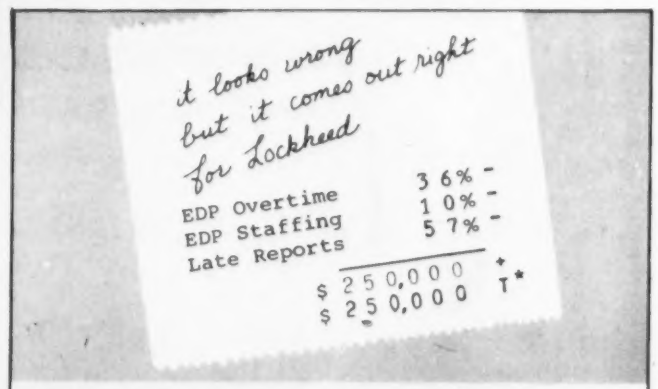
Com-Share Develops Series Of Statistical Programs

ANN ARBOR, Mich. – Com-Share, Inc., has developed a new series of statistical programs, selective utilization of mathematical statistics (Sums).

The programs include general descriptive statistics, stepwise regression, chi-square calculation, analysis of variance, and factor analysis.

The programs are available at no extra charge to customers of the company's time-sharing service.

The mailing address of Com-Share Inc. is Box 1588.



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Late EDP reports, backed-up schedules, and reshuffling of job assignments is a costly proposition. The DEADLINE! software package provides Lockheed-Georgia with a way of scheduling its entire EDP center according to Lockheed's own priorities with efficient time use. Annual cost savings are estimated at $250,000 . . . in the data center alone. For savings in *any size* EDP center, contact: Director of Marketing, Synergistic Cybernetics, Inc., 7777 Leesburg Pike, Falls Church, Va. 22043. Phone: (703) 821-2500.

SCI SYNERGISTIC CYBERNETICS INCORPORATED

West Germans Get National Communications System

BONN, West Germany – A national communications system that will allow clients all over the country to "plug in" by telephone to a computer is being planned in West Germany.

The West German Post Office and four German firms recently signed an agreement which will lead to the early establishment of the system.

Georg Leber, West German minister of communications and transport, said that the aim of the system is to provide small computer users with large-scale computer power without the purchase of expensive machines.

A West German Post Office statement said that in the U.S. the volume of long-distance data processing traffic will be as great in 1975 as the volume of telephone traffic today. West Germany must prepare to keep up with these developments, the report said.

The new system will be run by Deutsche Datel-Gesellschaft Fuer Datenfernverarbeitung MBH, in which the Post Office will have a 40% share of a capital outlay amounting to three million Deutchmarks.

The commercial firms involved are Siemens and Nixdorf Computer each with a 20% share; and AEG Telefunken and Olympia Werke, each with a 10% share. The headquarters will be in Darmstadt.

The company will operate by renting computer time to clients. It will both rent and sell the necessary teleprinter terminals and will provide standard computer programs.

An aim of the system will be to provide an advisory and educational service to introduce possible clients to the system, Leber said.

Leber added that it was hoped that the company could begin operating this month.

Communications Equipment Roundup

2400 Data Pump Modem Bell 201B-Interchangeable

MOORESTOWN, N.J. – Ultronic Systems, a subsidiary of Sylvania Electric Products Inc., has available a low-cost, desk-top 2400 Data Pump Modem, a solid-state synchronous device.

The 2400 Data Pump Modem is interchangeable with the Western Electric 201B data set and is said to be compatible with a variety of business machines and data processors, including the IBM 360, magnetic tape terminals, keyboard printers, and video display terminals.

The 2400 Data Pump Modem features a modular, plug-in design concept that includes special test switches for rapid unit verification.

The basic 2400 Data Pump Modem is priced at $1,600.

Ultronic Systems is at Mt. Laurel Industrial Park, Moorestown, N.J.

Mohawk Terminal Transmits 3,600 Bit/Sec With Option

HERKIMER, N.Y. – Mohawk Data Sciences Corp. has developed an optional feature for its data recorders which will allow the Mohawk units to transmit and receive information at 3,600 bit/sec over the Dial-Up (DDD) telephone network.

The feature allows Mohawk terminals to operate with modem 3300/36 data sets, manufactured by International Communications Corp. (Milgo) in Miami.

The optional feature will convert Mohawk 1100, 6400, and 7500 series data terminals for dial-up operation at 3,600 bit/sec.

The purchase price of a 7-channel terminal is $9,700, a 9-channel terminal is $10,500; and a 7500 system used with a communications module costs $11,500.

Mohawk Data Sciences is in Herkimer, N.Y.; International Communications Corp. is at 7620 N.W. 36th Ave., Miami.

Western Union Establishes Direct Line to Lebanon

NEW YORK – Western Union International, Inc. has established direct communications via satellite between the U.S. and Beirut, Lebanon, according to WUI President Edward A. Gallagher.

Redcor 721 Converter Accepts Eight Channels

WOODLAND HILLS, Calif. – Redcor Corp. is offering a Model 721 high-speed multiplexer analog to digital converter that provides throughput rates of up to 100,000 conversions and accepts eight channels of analog data with expansion capability to 128 channels.

A choice of full scale ranges of ±5V or ±10V is available. The 721 has a bit resolution ranging from 8 to 12 bits binary. Input configuration can be either single-ended or differential.

Base price for a complete 8-channel, 12-bit multiplexer A/D is $2,205. There is a 60-day delivery schedule.

Redcor is at 21200 Victory Blvd.

What English queen had six fingers on one hand?
Don't lose your head over a little historical trivia. We'll give you a big hint: She lost hers.
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Not yet? The hexadactyl was Anne Boleyn, of course.
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New Literature

Xerox Data Systems' Sigma 6 computer, the first developed by the company for business applications, is described in a new brochure available from XDS. Copies of the six-page brochure, 64-12-01A, can be obtained by writing: Xerox Data Systems, Sales Promotion Dept., 5300 W. Century Blvd., Los Angeles, Calif. 90045.

The first complete digital to analog converter in hybrid IC form is described in a new publication now available from the Helipot Division of Beckman Instruments, Inc. Featured in the two-page catalog sheet is the eight-bit, thick-film Model 845 D-to-A converter. This new unit includes an output buffer amplifier, a voltage reference, switching, and a resistor network.

For a copy of Catalog Sheet 845, write: Technical Information Section, Helipot Division, Beckman Instruments, Inc., 2500 Harbor Blvd., Fullerton, Calif. 92634.

A brochure from Data Systems Analysts, Inc. explains the organization and specialized qualifications of DSA and its people. It details the various services available singly or in combination to anyone with a software question or problem. Typical applications and projects are listed to show the scope of DSA, and to suggest its capability in related areas. Copies of the brochure can be requested directly from Data Systems Analysts, Inc., North Park Dive, Pennsauken, N.J. 08109.

The Delta 1 desktop video terminal with color capability and a wide selection of options is described in a new brochure. Its applications are suited to process control, inventory control, hospital-based computer information systems, educational institutions, file updating, information retrieval, reservation systems, production control, and preparing analytical forecasts. Delta Data Systems is at Woodhaven Industrial Park, Cornwills Hts., Pa. 19020.

The annual spring revision of the Digital Equipment Computer Users Society (Decus) program catalog lists over 70 programs available for the PDP-10, DEC's largest computer. The catalog is available on request from Digital Equipment Corp., Maynard, Mass. 01754.

A data sheet describing the new Potter DD 4314 disk drive, has been released. The data sheet provides complete specifications on the new unit which features an "on-line" capacity of 29.176 million bytes with 55 msec average access time. For a copy of the data sheet on the DD4314, write to Potter Instrument Co., Inc., East Bethpage Road, Plainview, N.Y. 11803.

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Mark-Sense Reader Interfaced with 029 Keypunch

By Frank Piasta
CW Staff Writer

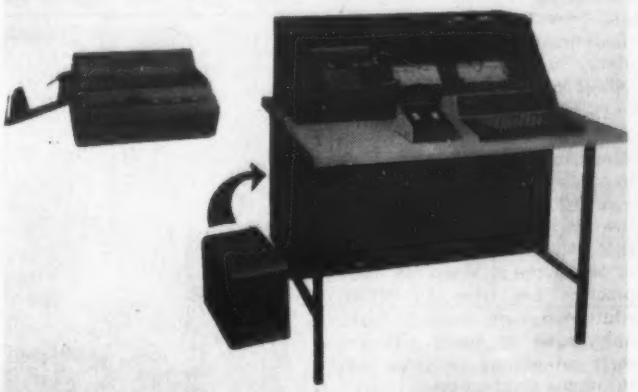
PHOENIX – Data from mark-sense documents now can be punched directly into IBM computer-compatible cards by using an interface from Motorola Instrumentation and Control Inc.

Designed to be used with the Motorola MDR Document Readers, the Document Reader/IBM-Keypunch Interface converts optically read data into standard Hollerith code punched cards using an IBM 029 keypunch unit.

Several functions can be performed with the document reader/card punch combination:

- The operator can manually register a tab card, enter data through the keyboard, and then enter data from the document reader. All the data is punched and printed on the same card.
- Using either manual or automatic versions of the document reader, the operator can register a card and then enter complete data from the first document in the reader. Each subsequent document in the reader's hopper can then be transcribed by depressing the Feed Key. During data transfer from the reader, the keyboard is locked to prevent the operator from entering data.
- The card punch may be programmed in the usual manner to duplicate and skip automatically. Data from the reader can be punched and printed either before or after the duplicate and skip functions.
- The automatic feed function is only possible with the automatic feed reader. The operator registers only the first tab card. All documents in the reader hopper are then copied automatically and in sequence.

None of the regular functions of the keypunch are impaired, according to Motorola. Installation of the unit is said to be simple and the entire unit along with its cable adapters is concealed within the keypunch cabinet.



Motorola interface unit (center) couples Motorola MDR optical reader (left) to standard IBM 029 keypunch to provide automatic conversion of data.

Either the MDR-8314A (manual feed) or the MDR-8324A (automatic feed) document reader can be used. Output from the reader is 12-bit parallel, character serial, over a single cable to the keypunch at 10 char/sec.

The document readers sense pencil-marked, keypunched, and preprinted marks entered on tab cards, forms, or page-size documents. Documents up to 8-1/2 in. wide and any length can be handled. Leading edge, trailing edge, or column strobe control signals can be used.

The Motorola Document Reader/IBM- Keypunch Interface may be purchased or leased. Purchase price is $1,500. Lease price for a one-year lease is $133/mo for the initial year and $35/mo for subsequent years. Two-and three-year contracts at lower rates are available. A $40 installation charge applies to each installation.

The interface is currently available on a three- to four-month delivery schedule.

Motorola Instrumentation and Control Inc. is a subsidiary of Motorola Inc. Its address is P.O. Box 5409.

CRT Terminal Features Dual Read/Write Cassettes for Data, Program Storage

SAN ANTONIO, Texas – An intelligent CRT terminal from Computer Terminal Corp., featuring dual read/write tape cassettes for data and program storage and functioning as a communications device, can be used for general computing.

The Datapoint 2200 desk-top terminal is equipped with a processor that has 2K to 8K byte recirculating memory using MOS shift registers. The terminal is used not only to provide local computing power, but also acts as a controller between the device and an automatic communications interface, according to the company.

Datapoint 2200 CRT Terminal

The company claimed a typical instruction execution time of 20 μsec. A complete instruction set, including binary and decimal arithmetic, can be performed, with no packed decimal facilities, however. Parity checking is done through a software routine, at the programmer's discretion.

The terminal is equipped with a communications adapter that can be connected to Bell equipment. The adapter can emulate Bell 103 and 200 series modems, the company said. Data rates up to 9,600 bit/sec reportedly can be accommodated.

The Datapoint 2200 can also be used off-line as a keyboard-to-tape device, the simulator program being stored on one tape cassette while the data is being recorded on the other.

The 2200 is designed to operate in both an off-line data preparation mode and an on-line unattended polling mode. No hardware changes are necessary to allow the device to operate within various business systems and remote computing environments. Application program changes are made simply by replacing the program cassette.

The cassettes used are standard Norelco-type units with a capacity of 150K bytes. Data can be written to or read from the cassettes at up to 300 char/sec, the firm said.

A magnetic tape drive capable of using 1/2 in. 800 bit/in. tape reportedly will be available for use with the 2200.

A 30 char/sec line printer is planned for future delivery.

An assembler and an operating system that can record programs on tape, and call and link them during operation will be supplied to the user without additional charge. Various applications packages, such as terminal and keyboard to tape simulators will be available, the company said.

A training program for user personnel will be established by the manufacturer. Charges for this service have not yet been determined.

The Datapoint 2200 will rent for approximately $150/mo for a keyboard-equipped unit with two cassettes and a 2K byte processor. Purchase price for the unit will be about $5,000. Initial customer deliveries are scheduled for September, the company said.

Computer Terminal Corp. is at 9725 Data Point Drive.

May 27, DP Accessories Supplement Corrections

Graham Magnetics, Inc. produces computer tape, not computer type, as reported on Page S/9.

The address of the Data Products Division of Honeywell (Page S/9) is Box 1369, San Diego, Calif. This division provides magnetic tapes, disks, and forms.

The chart at the bottom of Page S/14, Section C, paragraph 3, should read "Memorex – 67 (29%)." The percentage of the market for disk packs gave Memorex 29%, not 2.9%.

Reader Has 500 Word/Min Throughput

CAMBRIDGE, Mass. – An optical page reader with editing capabilities from ECRM, Inc. has a throughput rate of 500 to 700 word/min.

Called the Autoreader, it is designed for typesetting applications and programming operations where data is prepared for input to a computer.

The Autoreader is said by the manufacturer to be capable of performing the work of 12 to 15 teletypesetters or keypunch operators per work shift.

The device can read a previously entered font of English or foreign language text on paper 8-1/2 in. wide and any length. It is capable of recognizing upper and lower case letters, numerals, punctuation, spaces, and special symbols, by character comparison.

The text is then converted into such forms as unjustified punched paper tape, or magnetic tape. The error rate for the Autoreader is less than .03%, according to the company.

The ECRM reader incorporates editing capabilities. It can add material between lines and delete characters that have been so marked in the text. Paragraphs can be rearranged on the same page. Paragraphs from a separate page can be inserted onto another page of text.

The basic Autoreader system consists of an Autoreader, a PDP-8/L, an ASR 33 Teletype unit, a Teletype-Brpe 6-level punch, and supporting software.

Options available include a 9-channel magnetic tape drive, an error display device, a high-speed paper tape configuration, and a high-speed, 6-level, teletypesetter reader.

ECRM said that other options that are under development include additional software to increase font capabilities and the incorporation of the product into the DEC PDP-8/L typesetting system.

Price of the basic system is $89,000. Leases are available at approximately $2,000/mo. The prices include installation and a 90-day warranty.

Additional maintenance is obtainable on a contract or per-call basis, ECRM said. Deliveries are scheduled to begin during the third quarter of 1970 on a four- to six-month delivery schedule.

ECRM, Inc. is at 103 Erie St.

PDP-8 Disk-Compatible Interface Controls up to 8 Memorex Drives

BEDFORD, Mass. – A disk drive interface, compatible with the DEC PDP-8 line of computers, can control up to eight Memorex 630 and 660 disk drives or their equivalent. Bedford Associates, Inc. is offering the unit for time-sharing and control applications.

The Model 12 Interface allows PDP-8 users to increase storage capacity up to 224,074,400 eight-bit bytes, the company claimed.

Model 12 Interface characteristics permit the PDP-8 to provide address translation, optimizations of seeks, individual cyclinder write protection and scatter-gather read/write operations when connected as an intelligent bulk storage controller, the company said.

Temperature and humidity range of the interface allow its use anywhere a PDP-8 can be operated. Options include automatic 630 or 660 select capability for any mix of disk drives, and nonstandard sync format which permits adaption of the sync format to any user convention, the firm said.

The price of the Model 12 Interface is $13,500. The product is available only on purchase, with 45-day delivery.

The address of Bedford Associates, Inc. is P.O. Box 327.

Add-On Memory Raises 360/30 to 65K

By Frank Piasta
CW Staff Writer

LARCHMONT, N.Y. – Previously restricted to 32K memory by IBM, 360/30 users can now upgrade their systems to 65K with add-on memories from Computer Investors Group (CIG).

Also available for 360/40 and 360/50 models, the CIG memories are said to be completely compatible with the computers and operate within CPU cycle times ranging from 1.5 to 2.5 μsec.

Built for CIG by Data Recall Corp. of Culver City Calif., the core memory upgrades are designed to provide standard mainframe capacities for the 360.

According to CIG, the memories are priced up to 30% below IBM prices. CIG will either lease or sell memory upgrades. IBM's practice has been to provide additional core on a purchase-only basis to users who own their computers or lease them through a third party.

The memories are free standing with their own power supply, and cable connected in the same manner as IBM core. They are housed in cabinets finished to match users' existing computer systems.

All CIG memories operate at the same speed, allowing the user to retain his add-on memory when upgrading CPUs. The memory cycle rate is limited by the cycling rate of the CPU, with a maximum of 1.5 μsec.

Memory addressing in the CIG add-on is hardware compatible with the 360 and will require no software changes, CIG said.

The add-on memories are said to operate without dependency on complex timing signals such as those required by peripherals.

The memories are designed for on-site maintenance through pluggable components and a built-in tester which is said to be capable of exercising the memory in an off-line mode. Service will be provided by Honeywell service engineers, CIG said.

Prices for the most popular upgrades are as follows:

An upgrade for a 360/30 from E to F (32K) would cost $42,242 or lease for $1,020/mo. To enlarge a 360/40 from F to G configuration (65K) would cost $58,712 and lease for $1,418/mo, while an expansion for G to H (131K) would sell for $138,500 and lease for $3,345/mo. An H to I (262K) enhancement on a 360/50 carries a $222,648 price tag or costs $5,355/mo on a lease. All lease figures are for a three-year contract.

Currently, the 360/30 memories are available on a 30-day delivery schedule, while the 360/40 and 360/50 models are on a 60- to 90-day schedule.

Computer Investors Group, Inc. is at Symphonette Square.

CIG Add-On Core Memory

Keymatic Unveils Rent/Sale Plans For Encoders

BAY SHORE, N.Y. – One- and two-year rental plans, with an option to purchase, have been announced for the 1090 series key-to-tape encoders by Keymatic Data Systems Corp.

The units were formerly available only on a purchase basis.

Under the new plans monthly rental costs would be:

Model	1-Yr	2-Yr
1901	$560	$300
1092	701	375
1090	759	400

One-half of the rental charges paid to date can be applied to the purchase cost during the rental period, the firm said.

The Keymatic 1090 series generates 9-level magnetic tapes – 1091 generates 102 codes; 1092, 162 codes; 1093, 256 codes.

Keymatic Data Systems is at 56 Penataquit Ave.

Who makes data display systems for off-line and on-line, stand-alone and multi-terminal, entry and retrieval, key to mag tape and key to
Sanders 620 Stand-Alone Data Display System
Sanders 720 Data Display System
Sanders System 6000 Display Data Recorder

Professor James E. Archer, left, teaches on seven campuses simultaneously via videotaped lectures.

Videotaped Computer Science Course Used at Seven West Texas Colleges

By Harvey Elman
CW Staff Writer

LUBBOCK, Texas – Students at seven west Texas college campuses participate simultaneously in computer science classroom instruction from Texas Tech via videotaped lectures.

"Introduction to Computer Science," taught by Dr. James E. Archer, chairman of the department of engineering analysis and design at Texas Tech, is the first course of study shared by members of the Western Information Network (WIN). The videotaped method allowed WIN to begin services before a closed-circuit television network (for which it was organized) could be put into operation.

Archer's lectures, with blackboard illustration, were taped while given to students at Texas Tech. Six duplicates of the tape were made and shipped immediately to the other colleges – ready for viewing 24 hours after the lecture was given.

Lecture Preview

Receiving professors had an opportunity to preview the lectures before classroom showing. To implement instruction in the practical use of the computer, most schools also had computers available for student use. Tech employs an IBM 360/50 and a CDC 1604.

Education

The course was made possible through a Moody Foundation grant which purchased enough videotape equipment to allow all 18 member schools to participate.

Robert D. Whipple, associate director for WIN, said the course in computer science was chosen because of general interest in the field.

"It has proven highly successful, and interest has been expressed in repeating the first course next fall as well as adding a second, advanced computer science course," he added. Students who received live instruction at Texas Tech and those receiving it on videotape at the other six schools earned comparable grades on exams, providing one measure for evaluating the service.

The Texas legislature authorized WIN as a two-way, closed-circuit television and supplemental electronic communication facility for the interchange of ideas, talents, faculties, libraries, and DP equipment, as well as instructional programs.

Name of the Game

"Systems are the name of the game with the computer a major tool in solving complex problems whether they're social or technical," Archer said. "The computer is not the solution, but a *primary route* to the solution. Its ability to cope with a great mass of detail and its memory storage capacity are key advantages.

"A knowledge of computer sciences is absolutely critical when you're dealing with complex interrelationships, particularly in dealing with the social dilemmas of our time," Archer said. "But there is a problem in computer sciences.

"The knowledge of computer capability is building so fast that no one has time to write textbooks, and if they did, the books would be outdated before they could be published."

Other colleges participating in the first lecture series were, Hardin-Simmons University, Midwestern University, South Plains College, Angelo State University, Howard Payne College, and McMurry College.

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For more information, write or call Mr. Raymond A. Zack, Vice President and General Manager, Sanders Data Systems, Inc., Daniel Webster Highway South, Nashua, New Hampshire 03060. Tel. (603) 885-4050. Join the growing list of users: auto manufacturers, telephone companies, ban

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Students Learn Math Rules First, Then Use Computer

By Anne Nolan
CW Staff Writer

BUFFALO, N.Y. – A new concept of teaching mathematics with a computer is being tried at the Woodlawn Junior High School by Judith A. Merrill, chairman of the math department. The computer involved is an Olivetti-Underwood Programma 101.

Her course concentrates on having the students learn the principles of math first, and then use the computer to do problems that would ordinarily take a considerable amount of time. The computer can store 240 different instructions in a problem and operate to 15 decimal places.

Miss Merrill is currently working with seven 9th graders and 12 7th graders, and hopes to start with 8th graders next year.

Education

She also has two teachers to help her teach the course. The students work in groups of two and three with a 9th grader acting as an aide to the younger student.

Commonplace?

Asked if she thought computerized teaching would become commonplace in schools, Miss Merrill replied that it would depend on the hardware and software made available and the direction given by supervisors and people in math education.

Miss Merrill feels there is "a credibility gap between the Houston Space Center and the way math is being taught in the schools.

"When you see a rocket ship going up, you realize how far we have come in just a matter of a few years. Then you look at what we're doing in the 7th, 8th and even 9th grades.

"We're asking students to carry out difficult computations which detract from the math we're really trying to teach them. I think we're making a mistake in not taking advantage of hardware and possibly software that can take the tedium out of our work," she said.

Course Goals

She stated that the goals of the course include developing an interest in mathematics on the part of the students, developing independent study habits, and having the students look ahead to the future by appraising their situation as far as school and math are concerned.

"A computer is supposed to solve all problems, but if you don't prepare materials carefully enough so that the students can digest what you're trying to do, and if you don't have a purpose to your instruction, that is if you merely teach them how to run the machine, it's worthless," she said.

Miss Merrill enjoys teaching the course because it provides a different atmosphere with the children. "I don't have to be as formal and everyone can progress at his own speed," she stated. "I am beginning to be more and more sold on this type of instruction."

She finds computerized math teaching more beneficial than conventional means because "you accomplish everything you set out to do." There is the added aspect of being able to branch out in other directions because of the time saved, Miss Merrill said.

The program at Woodlawn started last September when Miss Merrill was given the computer and told to try to develop a course around it. Her computer background included courses at the University of Buffalo and IBM where she attended special classes for teachers. She has also worked with a Monroe Epic Calculator 2000 at the Campus School of the State University of Buffalo.

In addition to designing the computer course at Woodlawn, Miss Merrill is working on a math program for the Woodlawn Improvement Program while working on her doctorate at State University of Buffalo.

Iowa U. Gets $64,300 Conference Grant

IOWA CITY, Iowa – A grant of $64,300 was recently awarded by the National Science Foundation to the University of Iowa for a conference on Computers in the Undergraduate Curricula, June 16-18.

The conference hopes to disseminate actual experience and plans in the use of digital computers as an integral part of college course work. Refereed submitted papers will comprise the bulk of the parallel session conference, with invited papers, panel discussions, and demonstrations rounding out the meeting.

Content will be broad enough to encompass most academic fields at the two and four-year colleges as well as at the undergraduate levels of the universities. Nearly 200 papers have been contributed of which about 70 will be used.

Programming ability and related skills are not prerequisites for attendance.

An offer to send every college or university unable to be represented a free copy of the proceedings will be extended.

The registration fee for representatives of academic institutions is $15, and includes a copy of the proceedings at conference time. For further information write to Brooks Booker, Center for Conferences and Institutes, University of Iowa, Iowa City, Iowa 52240.

West Germany's Educators Employ Computer to Teach, Grade Students

By M.W. Martin
Special to Computerworld

BONN, West Germany – Television screens, tape recorders and teleprinters will aid a pioneering education experiment in an all-day school in Gelsenkirchen, West Germany. For the first time in the Federal Republic, computer assistance will be used to give systematic instruction at a secondary school.

Questions will not be asked by the teacher but by computer TR 86, manufactured by AEG, Nurnberg, which will also mark work. Pupils will transmit their answers by teleprinter to Aachen Technical University, 95 miles from Gelsenkirchen, where a DP system will register and evaluate them. Most of the cost of this $1 million experiment will be met by the Federal Ministry of Education and Science, which strongly supports DP research.

Initial preparations for this classroom experiment, due to begin next year, are already being made at Aachen. Engineers and technicians are feeding the computer, which up to now has been used for administrative purposes, with the data it will need for its teaching job. They are also elaborating a comprehensible computer language, subjects for programmed instruction, and examining the possibilities of their use at different age levels.

Coaches Children

Future timetables will include vocational guidance and training, technology, science subjects and language courses. The computer can also be used to coach children who have fallen behind in their work.

At the same time Gelsenkirchen's grammar schools are preparing their pupils for "study in the 70s." A new subject on the curriculum is "Informatik," in which pupils will be acquainted with the fundamental of cybernetics and DP technology. This is part of a series of experiments started simultaneously in France, Britain and the Federal Republic by the OECD (Organization for Economic Co-operation and Development).

Calendar

June 18-19, Washington, D.C. – Adapso's 29th Management Conference entitled "The Computer Services Industry in the 70s" and concurrent session presented by Adapso's Computer Timesharing Section on Timesharing. Contact: Adapso, 551 Fifth Ave., New York, N.Y. 10017.

June 21-24, College Park, Md. – Eighth Annual Computer Personnel Research Conference sponsored by the Association for Computing Machinery. Contact: Conferences & Institutes Division (CPR), Center of Adult Education, University of Maryland, College Park, Md. 20742.

June 23-26, Seattle, Washington – DPMA 1970 International Data Processing Conference and Business Exposition. Contact: P.O. Box 502, Park Ridge, Ill. 60068.

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CORRECTION

May 27th 'Accessories Supplement'

should have read:

Graham Magnetics, Inc.

Graham, Texas

-Products: computer tape

The Computer Industry in the 1970s

During 1969, U.S. companies chalked up over $10 billion in revenues from their computer industry activities . . . ten times the corresponding figure for 1960. In 1974, revenues of some $25 billion are expected.

That's how EDP Industry Report describes the decade just past in its special Review and Forecast issue, just published.

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ACM Elects Carlson President, Ralston Vice-President

By Harvey Elman
CW Staff Writer

NEW YORK – The only real surprise of the recent ACM election was the race that didn't count.

Walter M. Carlson and Anthony Ralston, as expected, were elected president and vice-president, respectively. Charles L. Bradshaw is the new secretary while George Glaser, who did not have to run, maintained his treasurer's position. The new offices became effective June 1.

However, the New York regional representative race was voided because of ACM charges of alleged electioneering by one of the three candidates.

Send Memorandum

According to ACM, Paul Oyer, president of Oyer Professional Computer Services and chairman of the ACM New York City chapter, sent a memorandum on ACM letterhead to local membership prior to the election urging his candidacy. The names of the other two candidates, James M. Adams, Jr. and Kenneth M. King were not mentioned.

Walter M. Carlson

Runoff Election

A runoff election for the New York region only will be held with the results due to be announced June 26.

In the members-at-large race, Herbert S. Bright, Aaron Finerman, and Donn B. Parker all won four-year terms. The first two are former ACM Council members, while Parker was the secretary.

The regional representative winners with length of terms are as follows:

Charles H. Davidson (2), North Central; George G. Dodd (3), East Central; Alex A.J. Hoffman (2), South Central; Willard J. Holden (2), Northwest; T. William Olle (3), Allegheny; Adrian Ruyle (2), Northeast; and Stuart S. Shaffer (3), So. Calif. Elected as the first representative from the newly formed European region was Philip L. Dreyfus for a four-year term.

Anthony Ralston

Carlson earned an M.S. from the University of Colorado in 1939 (chemical engineering). He is currently a corporate marketing consultant with IBM in Armonk, N.Y. Said the new president: "In the 1970s, there will be new opportunities and new pressures that will force further examination of ACM's priorities. Some of the key issues will be people, impact on society, technology, and ACM structure."

Outgoing President Bernard A. Galler will remain on the ACM Council for two years.

Only 718 Pass Exam for DP Certificate

PARK RIDGE, Ill. – Less than one-third of the total applicants for the Certificate in Data Processing (CDP) given by the certification council of the Data Processing Management Association (DPMA) have passed the exam.

Only 718 of the 2,312 who took the exam last February at more than 100 test centers at colleges and universities in the U.S. and Canada received the certificate. Last year, 962 of 1,748 applicants passed. Scoring and analysis of the exam results were performed by an independent testing and research organization.

The new recipients bring to 11,069 the total number granted the certificate since the first exam in 1962.

Societies

A change in the expansion of the exam was the addition of a fifth section on the principles of management and an increase in the number of questions in each section. Exam applicants must have three years of EDP experience and possess certain academic qualifications.

Five general areas were covered: DP equipment, programming and software, principles of management, quantitative methods, and systems analysis and design.

Asis to Run Clearinghouse On Information Sciences

WASHINGTON, D.C. – The U.S. Office of Education and the American Society for Information Science have announced that Asis has commenced operation of the Eric clearinghouse on library and information sciences.

Eric (Educational Resources Information Center) is a nationwide information system designed to serve the field of education through the dissemination of information about educational resources and research materials.

Funded by the Office of Education, U.S. Department of Health, Education and Welfare, this network consists of a central staff at the Office of Education and a number of decentralized clearinghouses, each focusing on a special subject area within the broad field of education.

As one of the Eric clearinghouses, Eric/Clis is responsible for the acquisition and processing of research reports and other documents on the operation of libraries and information centers, the technology used to improve their operations, and the education and training of librarians and information specialists.

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The Computerworld *Communications & Terminals Supplement* will reach our 35,000 paying subscribers, at more than 20,000 computer installations in the United States. These sites use 35,000 computer systems with a value of $15 billion, accounting for over 75% of the total value of computer systems installed in the U.S.

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Which Is Better Value?

Cost-conscious housewives in Burlington, Iowa are receiving help from a computer in selecting "best-buys."

Using an IBM 360, Benner Tea Co. is providing the actual price of food or other items by weight or measure. It is reportedly the first U.S. food chain to offer a unit price and total price on merchandise in all its stores.

Benner President Charles C. Fitzmorris Jr. said: "Without a computer we could not offer this shopping advantage. There are just too many different prices on too many different size cans, cartons, and packages for any chain to figure the price by hand."

A housewife, above, reads one of the computer-produced labels on a shelf in one of Benner's Burlington stores. The example lables show that Brand Y, a 128-oz bottle of bleach, costs 38 cents, as opposed to Brand X, a 32-oz bottle of bleach, which costs 22 cents. However, the per gallon price of Brand Y is only 38 cents compared with the 88 cent per gallon price of Brand X.

Plaintiffs in Suits Against IBM Ask Pretrial Coordination Motion

Special to Computerworld

MINNEAPOLIS – The four computer firms and the Justice Department suing IBM in separate antitrust actions should coordinate their pretrial investigations for efficiency, according to a motion filed in U.S. District Court.

Federal Judge Philip Neville will consider the coordination motion and report on efforts to add a fifth plaintiff to the antitrust case during a hearing here, June 11.

Trying to coordinate their pretrial investigation with the Justice Department are Control Data Corp. (CDC), Data Processing Financial General Corp., Programmatics Inc., and Applied Data Research Inc. (ADR).

The potential fifth plaintiff is Howard S. Levin, former president of Levin-Townsend, who filed an antitrust suit against IBM in Federal Court's Southern District of New York, where the Justice Department suit is pending [CW, April 29].

A federal panel on multidistrict litigation is currently considering an appeal of its earlier decision to transfer Levin's suit to Minneapolis.

Slow Pace

Protracted arguing over the slow pace of pretrial work has marked the court conferences here between IBM attorneys, its opponents, and Neville.

The coordination motion, if approved, would give the firms a court order providing:

- Approval for them to compare notes with the Justice Department on any document, record, or other material produced by IBM for either of the suits.
- A requirement that IBM make its records available to the four firms for copying within 20 days of the time they are produced for the Justice Department.

Neville would have to revise his protective order of Jan. 23, which severely limited pretrial investigation to the pending case. According to the order, records produced may be shown only to the attorneys, to persons involved directly in litigation, or to the judge.

The order requires that answers prepared for questions or interrogatories be given only to the attorneys without copies being filed with the federal court clerk in St. Paul.

Blanket Secrecy

Blanket secrecy was imposed by the order so that trade secrets of the firms are protected. Both the protective order and an accompanying pretrial investigation schedule were issued by the judge to try to break a logjam encountered in discovery efforts by both sides.

To date, the schedule for inspecting records furnishing questions to the opponent and receiving answers has not been met to the satisfaction of either side.

The plaintiffs contend that IBM is trying to bury them with millions of documents, having produced two million to date and promising as many as four billion more.

IBM has complained of overlapping questions submitted by the four firms, two of which, Applied Data Research and Programmatics, have merged since the suit was filed. The merger partners are seeking a time extension from Neville to object to and answer IBM interrogatories.

Control Data is seeking an order for IBM to provide more detailed information involving its pilot study of 30 key customers and marketing accounts. It also wants some IBM documents reopened for further investigation.

CDC so far has answered IBM's first set of questions, while IBM has not answered any interrogatories to date.

Action Overlap

The computer firms contend that their action against IBM overlaps that of the Justice Department, although federal law prohibits combination of private and governmental suits. "Access to the same information which the government is receiving from IBM is necessary to meet the private plaintiffs' reasonable needs," said a memorandum accompanying the motion for coordination.

The firms want to see the documents and answers that IBM furnishes the Justice Department as well as to communicate with Justice Department lawyers about pretrial discovery.

"Because the private antitrust plaintiff is functioning in a quasi-public capacity, supplementing the government's prosecutatory agencies to promote effective enforcement of the antitrust law, it is obvious that the private plaintiff should be permitted and encouraged to communicate with the Department of Justice," said the memorandum.

The plaintiffs' memo stressed their interest in aiding antitrust prosecution by the government against IBM.

Security Called Problem of Management

By J.H. Bonnett
Special to Computerworld

LONDON – The problem of security is essentially a management problem, the chairman of a large independent UK software house told an audience of leading London businessmen at the Computing in the City Conference.

Alex d'Agapeyeff, chairman of CAP Ltd. and deputy president of the British Computing Society, castigated businessmen for choosing their computer systems and personnel with less care than they would choose a personnel officer.

The problem, he warned, is one that will become increasingly severe and must be borne in mind from the system design stage onward. Security arrangements now imposed in the UK, even on a physical basis, are, he pointed out, grossly inadequate compared to those normally taken in the U.S.

He suggested that certain fluctuations in the price of Australian mining shares in the UK, for example, may have been the result of an industry leak. The answer at the moment, he proposed, lies in tighter control within computer rooms and the establishment of a stronger code of professional ethics among computer industry personnel.

In the future, the answer will be the implementation of more sophisticated systems that are adequately designed, he said. D'Agapeyeff warned that when a system failed, it failed completely, unlike the telephone system which gently crumbled away.

Password systems, he thought, could be easily thwarted and adequate management control was essential. "Real-time increases the problems immensely and painstaking design from the start is the answer."

CAP Ltd. has been closely concerned with a number of systems presenting security risks, including the Barclay Bank credit card system.

UCC Chairman Sam Wyly Chosen To Receive Horatio Alger Award

DALLAS – Sam Wyly, chairman of the board of University Computing Co. (UCC), was one of 10 Americans chosen to receive the 1970 Horatio Alger award.

The award, presented by the Horatio Alger Awards Committee of the American Schools and Colleges Association, honors persons who achieve outstanding success despite humble beginnings. The award is named for Horatio Alger, the 19th century novelist whose fictional heroes overcome hardships and poverty to win fame and fortune through hard work, honesty and determination.

Dr. Norman Vincent Peale presented the awards last month at the Waldorf Astoria Hotel in New York.

Winners of the award are selected annually by ballots distributed to 500 colleges and universities throughout the U.S.

Wyly founded UCC with a $1,000 investment, three customers, and a handful of employees. Today UCC has assets of more than $300 million and employs 5,000 persons in 18 nations. With UCC, Wyly turned into reality the computer utility concept, whereby computer power is distributed to remote consumers much as electricity is distributed from a utility to homes.

Other recipients of the 1970 Horatio Alger awards include: Hiram L. Fong, U.S. Senator from Hawaii; Luther H. Hodges, chairman of Research Triangle Foundation and director of several corporations; and Carl B. Stokes, mayor of Cleveland.

Past recipients include Dwight Eisenhower, Herbert Hoover, Eddie Rickenbacker, David Sarnoff, Conrad Hilton, J.C. Penny, Dr. Ralph Bunche and Bernard M. Baruch.

Boeing Computer Services Division Employs 3,000

SEATTLE, Wash. – Boeing Co. is going into the computer services business.

T.A. Wilson, president of the aerospace firm, said Boeing has established a new computer services division to include all the company's computer capabilities presently in Seattle, Philadelphia, Huntsville, Ala., and Wichita, Kansas.

The combination of these capabilities under a single organization will permit improved Boeing efficiency as well as the sale of computer services to customers throughout the U.S. and Canada, Wilson said. Initially, he added, Boeing will have more than 3,000 employees assigned to the division, which has computer equipment valued at more than $100 million.

R.W. Tharrington, who has been a vice-president and general manager of Boeing's Vertol Division, was named a group vice-president, with J.H. Goldie, general manager of the new division, reporting to him. Goldie has been Boeing's corporate director of planning. H.N.

Extel Establishes Data Systems Unit

Special to Computerworld

The Exchange Telegraph Co. of London has formed a Data Systems Division which will provide equipment and maintenance to users on a 24-hour basis. It is aimed at time-sharing terminal users. An agreement has also been reached by Extel with Computer Terminal Corp. of San Antonio, Texas, enabling the latter's video terminal to be offered in the UK.

Banks' ACS Criticized for Poor Organization, Control

By Harvey Elman
CW Staff Writer

SAN FRANCISCO – The automated customer services' (ACS) operations of many banks are too loosely organized, staffed with inadequately and improperly trained personnel, have poor communications with other bank line and staff functions, and lack overall control and coordination.

This is the view of Richard S. Mathews, president of Data Facilities Management Inc., Darien, Conn., a firm specializing in ACS assistance to banks.

In an interview with CW, Mathews stated: "Many banks have jumped on the bandwagon of ACS without conducting any market research, and consequently have lost considerable money when these services proved unsuitable to their marketing situations."

Reevaluate Objectives

Mathews, before the recent National Automation Conference of the American Bankers Association (ABA) here, said that banks must reevaluate their objectives for being in the ACS business. The opportunity for banks to achieve a meaningful profit from ACS without making a major business commitment has definitely passed, he stressed.

Some of the earliest reasons for entering the business are no longer valid for most banks, he said. He gave as an example the sale of excess computer capacity with which banks expected to increase income. But banks frequently have sold excess time on their computers to customers at prices substantially below prime-time rates.

He noted that some banks are realizing the fallacy of this approach.

Ultimately, the banks would run out of computer capacity and would have to pay prime-time costs for additional equipment. Mathews estimated that about 1,000 of the 14,000 banks in the nation have over $10 million in business and must use extensive computer services.

Confusion results in many banks about desired ACS goals and objectives, Mathews said, from a general absence of specific revenue and profit goals, and a lack of forward planning for existing as well as future services.

Costing and pricing of automated services are compounded for those banks that sell "customized" programs, he added, because they "make more costing and pricing decisions with less factual data to support their estimates."

'Inexact Science'

He admitted that the pricing of computer services is, at best, an "inexact science."

The solutions are fairly easy to identify but he conceded that the primary cause might be more difficult to remedy.

If banks were in the business to make a profit from fee income solely, he noted, they would not tolerate the deteriorating profit situation they are in today. All phases of their operations would be improved and their pricing would become more thorough.

As conditions exist today, he maintained, banks make too many concessions for fear of alienating "good customers." The result of this reluctance is to raise prices in case of poor initial estimates, or in some cases where the scope of the original job has been altered substantially, and charge for extra clerical or machine time to correct customer errors.

Many computer industry executives are predicting that the "successful participants" in the DP services business will be a handful of companies operating competing networks throughout the country.

A few of the companies moving in this direction are University Computing Co., Computer Sciences Corp., Leasco Data Processing Equipment Corp., and Western Union.

Mathews questioned whether even the largest banks can compete on the basis of a national network, because of the magnitude of the investment required and the equity incentive needed to attract the competent personnel to develop, manage, and operate the business.

"To offer good DP services, banks must hire and train people for specific applications. And this is tough to do. It's one reason why 90% of all computers in this country are still underemployed, according to a survey conducted last spring by the Research Institute of America," he continued.

Success is Marketing

"All of these problems in the computer room are signs and products of a fast-changing DP marketplace. Unbundling is question-marking costs and cost control. The price of success now is marketing."

In addition to ITT Data Services and Computer Technology of Ling-Temco-Vought, which he said "should become big factors in the ACS business," Mathews included IBM's subsidiary Service Bureau Corp. (already playing a dominant role), Honeywell, and Univac.

He noted that the future impact of spin-off centers such as GT&E Data Services, Lever Data Processing Services, and McDonnell Automation Center is hard to predict currently, but said "they surely will be significant competitors also."

Management Research Opens in Dallas

AUSTIN, Texas – Management Research International, Inc. has opened its Dallas office.

The five-year old firm is principally engaged in computer-based information services and systems. Its activities include management science consulting, seminars for management, and the design and development of information processing systems.

Ron McDade, manager of MRI's Dallas office, stated that the new office is part of a general expansion to serve customers with the firm's new data management System 22000.

The MRI offices are in the LTV Tower.

Other Expansions

Courier Terminal Systems Inc. has opened western regional offices in Los Angeles. Courier manufactures CRT terminals for on-line applications, and recently announced a new hard-copy printer to interface with its terminals.

Expansions

Systems Engineering Laboratories Inc., Ft. Lauderdale, Fla., has broken ground for a 210,000 sq ft corporate headquarters facility.

The new building will be the first in a series of Systems facilities on a 47-acre site in northern Ft. Lauderdale, and is expected to be completed by March, 1971, at a cost of more than $3.5 million.

General Automation, Inc., of Santa Ana, Calif., has leased a new manufacturing facility which will triple production capacity for the company's industrial computers. The new facility is a 108,000 sq ft plant in Anaheim, Calif.

Burroughs Corp. now has two million sq ft of engineering and manufacturing facilities in Southern California with the opening of a 150,000 sq ft electronic interconnection products plant in Carlsbad. Output of printed circuit boards for Burroughs electronic computers and data processing systems makes the facility the only one of its kind in the West and represents an investment of more than $19 million over a five-year period.

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Trade Shorts

Computer Image Corp., Denver [CW, June 3] has entered into a sales agreement with Animacion Electronics, Mexico City, to allow the Mexican company to represent Computer Image in the sale of advertising services based on the Scanimate computer in Mexico.

A regional training and systems center designed and operated by NCR for its computer customers has opened in Columbia, Md.

GE's Communications Systems Division won two of five Virginia state awards made to large companies for purchasing efforts designed to help small businesses.

Computing Corp. International, Denver, will concentrate its efforts on the management information system (MIS) market with an adaptation of the Time-Sharing Business Package (TSBP) especially designed for use on in-house, on-line systems.

U.S. Industries Inc., Dallas, has acquired exclusive rights to market and operate in 46 states and internationally all systems developed by CCC Computer Corp., Dallas.

An agreement has been reached between Western Canada Steel Ltd., Vancouver, B.C., and World Systems Laboratories Inc., the Bethesda, Md. management sciences firm, for worldwide marketing of the Lectropace system for computer-based process control of electric steelmaking operations.

BCD Computing Corp., Deer Park, N.Y., has appointed one distributorship organization and two marketing representatives for its Dimbo-10 information retrieval system and for the BC-DC line of compatible controllers for removable-disk memories.

The representative firm will be Adams Business Machines, Farmingdale, N.Y. Redmar Associates, Needham, Mass., and Engineering Marketing Associates, Dayton, Ohio, are the marketing representatives.

Director Recap

A. Brean Murray, director, senior vice-president, and member of the executive committee of Cogan, Berlind, Weill, and Levitt, Inc., and Olaf Rasmussen, president, Service Technology Corp., Ltd., were elected directors of Comma Corp., New York.

The board of directors of Ex-Cell-O Corp., Detroit, has elected H. Glenn Bixby chairman of the board and chief executive officer of the corporation.

John A. Johnson, vice-president international of the Communications Satellite Corp., Washington, D.C., has been elected chairman of the Interim Communications Satellite Committee.

Douglas T. Tansill, vice-president of Bankers Trust Co., has been elected to the board of directors at Technitrend, Inc., Pennsauken, N.J.

Reservations World Opens Data Center

NEW YORK – Reservations World has opened its new "showcase" data center, giving New Yorkers a street-level look at a multimillion dollar RCA computer complex. One of the first remote computing systems with time-sharing capabilities in the hotel reservation industry is included.

Jerry Jordan, Reservations World president, said the new equipment, RCA Spectra 70/45 and 70/46 computer systems, opened the way for carrying on general reservations activities in combination with remote processing of bookkeeping routines of hotels and motels throughout America.

"These computers will keep pace with a business which has almost doubled during the past 12 months," he added.

"Our commitment to real-time reservation service in combination with remote computing means that we have added an important new dimension to tailored service available to the variety of hotels and motels in the lodging industry," Jordan declared. "We plan to offer automated front and back office accounting and management information to the entire industry."

Jordan said the RCA Spectra 70/46 system is being used by his programmers to develop the special software for the hotel industry plus development of systems for the entire travel industry.

He indicated that Reservations World subscribers later will want to tie into the company's computer-communications network for inventory control, preparation of morning reports, night audits, market forecasting, personnel staffing, and other key accounting functions.

Reservations World operates six regional communications centers which accept toll-free calls from travelers in the U.S. and Canada. Reservations data is relayed from these points to the computer center over 10,000 miles of leased telephone lines.

Establishment of Europe Market For Computer Industry Suggested

LONDON – The British government should endeavor to establish a European computer community in which national companies would satisfy different sectors of the market, according to an English computer expert.

Speaking before a subcommittee of the Select Committee on Science and Technology, which is investigating the computer industry in Britain, Iann Barron, managing director of Computer Technology, said that Britain had insufficient resources and too small a market to support a comprehensive computer industry.

Concentrate Resources

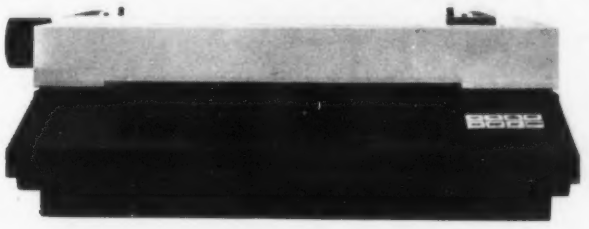
With a European base, the available resources could be concentrated and the market could support the necessary level of investment, he said.

Government purchase of computers should not be used as a method of supporting computer manufacturers, he said.

Such discrimination was counterproductive, he continued, because the government did not obtain the best systems, and the manufacturers were encouraged to operate in non-competitive areas.

Barron recommended to the subcommittee that the present policy of encouraging the use of computers by investment grants should be extended to software.

A central systems group should be set up he noted, to coordinate the vast amount of computer expertise which was "locked away" in government establishments.



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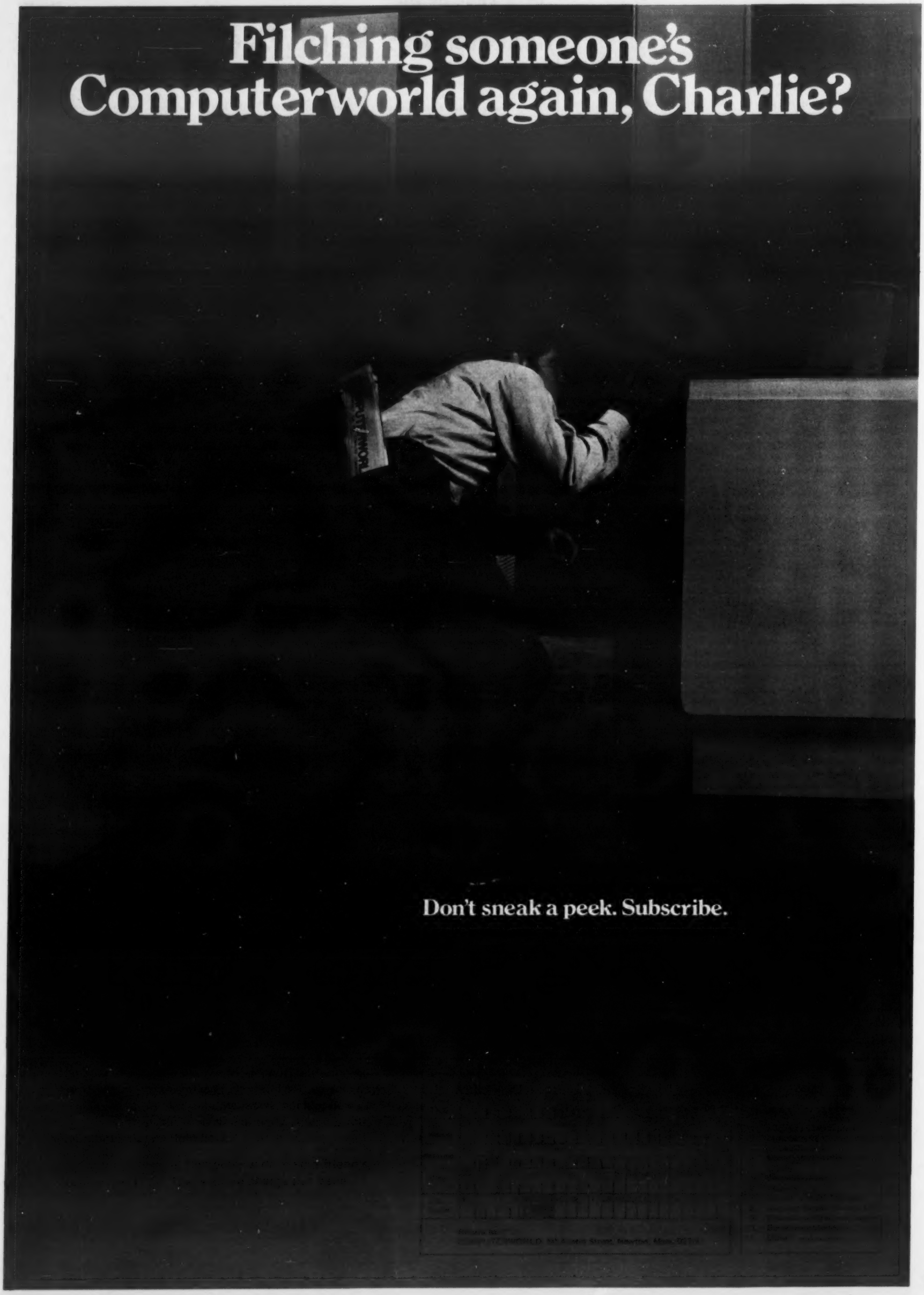

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NCI Names Callan Executive Officer

PHOENIX – Robert W. Callan has been elected chief executive officer of National Computing Industries (NCI). Callan will be responsible for total corporate administration, marketing, accounting, technical services, corporate acquisitions, and the soon to be announced international activities of the company.

Callan comes to NCI with extensive experience in the design, implementation and marketing of proprietary software and hardware products, systems and services.

He was vice-president and general manager of Pillsbury Management Systems, a subsidiary of the Pillsbury Co., and served as manager of Information Systems Research and manager of the time-sharing project for GE's Tempo operations in Santa Barbara, Calif.

He has also done considerable research into information theory, pattern recognition devices, artificial intelligence, cognitive processes and related activities.

Prior to joining NCI, Callan was a consultant to Computer Sciences Corp., and during the past year served as vice-president and division general manager of Academy Computing Corp.

He is a graduate of the University of Minnesota and has been in the data processing industry for the past 17 years.

Executive Corner

Other Moves

■ Randolph M. Wright has been elected vice-president of Electronic Graphics, Inc., Garland, Texas.

■ Lee Neumann has been named president of Interlink Sales, a division of Interlink Corp., Chatsworth, Calif.

■ Floyd E. Burnell has been appointed president of ENC Industries, Inc., a subsidiary of Diversified Technologies, Inc., Hatboro, Pa.

■ William R. Lonergan has been appointed vice-president of Computer-Based Systems, planning research, Los Angeles, Calif.

■ Paul Des Jardins has been named vice-president of computing technology at Allen-Babcock Computing, Inc., Los Angeles.

■ Norman B. Conwill has been appointed vice-president of OEM marketing for Marshall Data Systems Division of Marshall Industries, San Marino, Calif.

■ Donald R. Gordon, William E. Gunday, and Joseph F. Nash Jr. have been promoted to vice-presidents of EDP Resources Inc., White Plains, New York.

■ Stanley Noss has been appointed vice-president and director of programs management for the Kearfott Division, Singer-General Precision, Inc., Little Falls, N.J.

■ S.W. Horrocks has been appointed vice-president of Lockheed Electronic Co., and general manager of its Data Products Division., Los Angeles.

■ Wallace H. Green, and P. James Terragno have been appointed vice-presidents of Remac International Corp., Gaithersburg, Md.

■ Kenneth B. Winiecki has been elected vice-president, technical development of Information Services Inc., Babson Park, Mass.

■ Ian Moore has joined Facts (Financial Associates Computer Technical Services, Inc., New York City) as vice-president of marketing and sales.

■ Leonard R. Eyler has been named vice-president of operations at Syntonic Technology, Inc., Philadelphia.

■ Input Data Corp., Los Angeles, has named James L. Rothman as executive vice-presid

Orders and Installations

Burroughs Corp., Detroit, Mich., has received orders for its B2500 from Sugarman Brothers in Medford, Mass., and Chaffey College in Alto Loma, Calif. Sugarman Brothers has also ordered a B500 to implement the company's change-over to computerization. Kings Lafayette Bank of N.Y. and Long Island has ordered a B3500.

The University of Paris has ordered a Univac 1106 system for its Laboratory of Theoretical Physics and High Energy at the Orsay campus. Bonnierdata AB, Stockholm, a Swedish printing and publishing concern, has also ordered an 1106.

American Wine & Importing Co. of Dallas has installed an on-line, computerized inventory system, called Wine/Manage, from Management Systems Corp.

James Cook University of Townsville, North Queensland, Australia, has ordered a PDP-10 from Digital Equipment Corp. The computer will be used for on-campus time-sharing, as well as for outside users.

PHI Computer Services, Inc., ordered a large capacity storage unit (LCS) for the firm's data center. Designed to take fullest advantage of the center's IBM 360/65, the new LCS unit is part of a major change in PHI's configuration.

Standard Oil Co. of Indiana has installed an IBM 360/85 to process commercial and scientific information for the parent company and three Chicago-based subsidiaries.

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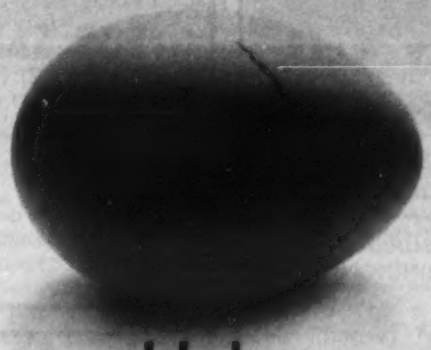

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Contracts

A contract for lease of a Univac 1106 computer system valued at $2.4 million has been awarded to Univac by the Social Security Administration (SSA), a major agency of the U.S. Department of Health, Education, & Welfare. The system is expected to replace the commercial time-sharing terminals now leased by SSA for research personnel and to more effectively handle the management and statistical data processing workloads now spread over several systems in the SSA's central computer complex.

Sanders Associates has received a $2.7 million developmental contract from the Federal Aviation Administration for a basic model of a radar air traffic control display subsystem. The subsystem will be used in human factors and other design considerations for the enroute portion of the national airspace air traffic control system. The system includes three major groups of equipment that process, transfer, and display control and flight information to air traffic controllers.

Informatics, Inc., Sherman Oaks, Calif., has been awarded a series of contracts by the First National City Bank to participate jointly with bank personnel in the development of transfer processing systems and related services. The contracts, totaling about $1 million, are being carried out by the software firm's Financial Systems Division, River Edge, N.J.

The Washington National Insurance Co. has contracted with IBM for the design of a consolidated information system to process ordinary life insurance policies. Under the system all transactions for any one of Washington National's 375,000 policies will be processed against a master file in a single, daily, cycle. Terms of the contracts were not disclosed.

Infoton, Inc., Burlington, Mass., has received a research contract for $83,700 from the Aerospace Medical Research Laboratory of the U.S. Air Force for development of an adaptive pattern recognition technique.

A contract awarded by the Air Force will create a computer link between three commands at Air Force Logistics Command headquarters this year. The contract, awarded to General Electric, will produce computational resources for engineering, and simulation, training, and education (Create), a time-sharing computer system that will support AFLC, Air University, and the Air Force Communications Service, at 10 Air Force installations.

The General Electric Co., Phoenix, Ariz., has been contracted to furnish and install electronic data processing equipment at the Air Force Logistics Command/Air Force Institute of Technology computer complex, Wright-Patterson Air Force Base, Ohio. The estimated average monthly equipment lease and maintenance cost for fiscal year 1971 will be about $103,378.

Viatron to Get MOS Arrays From General Instruments

BEDFORD, Mass. – The first in a planned series of contracts that could lead to procurement of more than one million packaged MOS arrays, worth more than $20 million over the next 18 months, has been issued by Viatron Computer Systems Corp. here to General Instrument Corp., Hicksville, N.Y.

Laurence C. Drew, vice-president of Viatron's microelectronics operation, said that the initial release was for $3.5 million and that negotiations are continuing for follow-on agreements to cover even larger quantities of additional MOS arrays.

Drew added that the General Instrument arrays will be used in Viatron's data management terminal now being delivered, as well as the Model 2140 and 2150 general-purpose computers scheduled for delivery this summer.

General Instrument was the first semiconductor house to assist Viatron in the design of its MOS circuitry and has been working with the Bedford company on the development of MOS circuits for the past 18 months.

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Goodman Leaves DPF&G, 2d Top Executive in Month

NEW YORK – Citing his wish to spend more time with his family and on his personal interests, Harvey Goodman, founder of Data Processing Financial and General Corp. (DPF&G), resigned as board chairman and chief executive officer.

Goodman remains a director and adviser to the company as well as a major shareholder.

This is the second defection of top management from the company in a month. Earlier Archie J. McGill resigned as president of DPF&G after taking office only last August. A DPF&G spokesman had said that the company accepted McGill's resignation "reluctantly" and that McGill had pleaded "certain personal requirements."

DPF&G reported a large drop in earnings for the nine months ended Feb. 28. Net fell to $2.2 million after extraordinary charges of more than $5 million, from $5.9 million for the year earlier period. On a per share basis this was a drop from $1.76 to 60 cents. The extraordinary charges included $2 million for writeoffs for old computers and $3 million for reorganizing service operations.

DPF&G Vice-President Alan E. Shalov said in an interview that fiscal 1970, which ended May 31, had been "a bad year." He added, however, that he thought the troubles were over.

Shalov noted that leasing operations are doing well and that anv remaining problems are in the service area. He said the company would announce year-end results in two weeks.

Nobody on Top

Lacking both president and chairman, the company is now being run by its remaining officers under the supervision of an executive committee. The committee includes Jerome H. Naftol, treasurer and a director, and Arthur B. Kramer, a director and lawyer, as well as Shalov.

Shalov said that in his opinion "there's nothing to worry about." He remarked, "We feel the ship can run on a very good basis until we pick a successor."

The directors hope to name a new chief executive officer within the month, according to Shalov, who said the company is looking at "some really top people."

Under Goodman's direction DPF&G was one of the first companies to file a civil antitrust suit against IBM. The suit is still in the pretrial stages.

Goodman, who owns over 12% of DPF&G's outstanding common, said that he will remain "vitally interested" in the company and declared that the firm is "in a fine financial condition in these troubled times." He noted, "With the many opportunities available to the company, the future can't be anything but bright."

DPF&G is the largest independent lessor of computers. Figures compiled by International Data Corp. show that in 1969 DPF&G captured 11% of the leasing market, followed by Greyhound and Itel with 10% apiece.

GAC to Lend Levin-Townsend $20 Million, Sell Computer Unit for Preferred Stock

NEW YORK – After running through Boothe Computer, Standard Prudential Corp., and Randolph Computer Corp., Levin-Townsend Computer Corp. has now turned to GAC Corp., a diversified holding company, for rescue from its financial woes.

The two have agreed in principle that GAC will sell its computer leasing operations to Levin-Townsend, and lend Levin-Townsend $20 million.

Levin-Townsend is currently $14 million in arrears on payments for computer equipment to IBM. When IBM began pressing for payment last month, Levin-Townsend filed a $55 million damage suit against the manufacturer. IBM then agreed to continue deferring debt payments.

The deal with GAC calls for Levin-Townsend to give 100,000 shares of a new cumulative convertible preferred stock issue. Each share would pay an annual dividend of $8, and would be convertible into 20 shares of Levin-Townsend common.

Since Levin-Townsend has only 3.3 million shares outstanding, conversion of the new issue into two million common shares would give GAC nearly 38% ownership of Levin-Townsend.

A spokesman for GAC said his company intends to take at least one seat on the Levin-Townsend board of directors.

The transaction will bring to Levin-Townsend computers worth about $50 million from GAC Computer Leasing Corp., boosting L-T's portfolio to $205 million. GAC's finance subsidiary would loan L-T $20 million, secured by lease rentals and equipment. The loan would bear interest at the prime rate plus four percentage points.

The prime rate is currently 8%.

Levin-Townsend would begin paying the principal of the loan in 1972, with final payment due in 1976. The proceeds of the loan would be used to pay IBM and other creditors. The company's total debt to IBM is about $45 million.

L-T President James E. Townsend said that IBM has been told of the negotiations with GAC and has agreed to defer action on the debt until June 16. Townsend said that this will give the two companies time to prepare a definitive agreement.

Levin-Townsend has not yet revealed the results of its fiscal year ended March 31. The nine-month report showed a net loss of $15.9 million after writeoffs of $19.5 million on bad investments.

GAC's computer leasing division, formed in March, 1968, currently owes GAC's finance subsidiary $38 million. GAC Chairman S. Hayward Wills has reported that computer leasing operations experienced a $600,000 loss in 1969.

GAC has been openly trying to get out of the computer leasing business.

The deal needs approval of GAC's executive committee and directors, and Levin-Townsend's shareholders. The shareholders will vote at L-T's annual meeting July 16, where former L-T head Howard Levin has promised a proxy fight for control of the company.

Levin said that he hadn't any comment on the proposed deal with GAC.

9% of Spectral Shareholders Oppose Merger With Systems Engineering

FORT LAUDERDALE, Fla. – The merger plans of Systems Engineering Laboratories and Spectral Dynamics have been threatened.

Holders of about 9% of Spectral's outstanding common have "validly objected" to the match, and the terms of the agreement provide that SEL may terminate the merger if holders of more than 5% of the Spectral shares dissent.

SEL said that its directors will meet "to consider this matter." An SEL spokesman refused to speculate on whether the board would drop the merger.

The planned acquisition calls for an exchange of about 253,000 SEL shares in return for all of Spectral's 405,000 outstanding common shares. The deal had been approved by shareholders of both firms at two special meetings April 23.

SEL announced its director's meeting last week about three hours after a 104,000 share block of SEL stock was traded on the American Stock Exchange. The trade was at $16.125, down $3.

The SEL spokesman said he didn't know if the market activity was a result of the Spectral situation, but added he knew of nothing else that might have affected the market.

Under the terms of the merger agreement Spectral shareholders would receive five eighths of a share of SEL stock for each share of Spectral.

Spectral, based in San Diego, Calif., is a designer and manufacturer of electronic instruments used in vibration and acoustic analysis, data acquisition and structural design, and of custom systems using these instruments. The company markets through sales representatives.

The merger is designed to augment SEL activities in specific-application data processing systems. SEL also manufactures and sells the minicomputers used in its systems.

Funds Urged to Handle Own Operations

NEW YORK – Mutual fund organizations are going to have to consider back office systems as total financial service if they want to maintain their position in the overall financial community, according to a San Francisco computer and mutual funds expert.

Moderating the National Mutual Fund's conference panel on "Operations, the Industry Monkeywrench," Alan Hochschild, president of Western Operations Inc., warned that until this is done, shareholder relations would continue to suffer and service problems will continue to plague the industry.

This total concern for the shareholder is the primary reason mutual funds are going to handle their own operations functions rather than have service agents assume this responsibility, he said.

Hochschild warned those attending the conference that even though his San Francisco-based company sells a successful mutual fund system, funds shouldn't immediately run out and purchase a computer system.

Avoid Computers

"A fund should stay away from a computer as long as possible and have everything done by hand," he commented. "Then when they have or anticipate the volume which demands a computer system, they should examine all of the variables."

He explained that the fund could attempt to develop its own system, use a bank's service, use a service agent, or purchase a packaged mutual fund system.

The primary criterion for selection is the size of the fund, the activity and the anticipated growth. He stated that unless the fund was associated with an insurance company, or can share computer facilities, they probably couldn't economically support their own computer installation with less than 50,000 accounts.

Concerning the development of a particular system, Hochschild commented on the lack of regulation concerning the back office operations.

"Most of the SEC rules cover only the buying and selling areas," he said. "The rest of the so-called rules are simply a continuation of habits." He added that standardization will hopefully come in the future, but until then systems architects should be creative in the design of their systems.

"The best system for a mutual fund's back room operation is one which is elegantly simple," he explained. "This type of system can handle the volume of paperwork which is encountered by an active fund.

"You have to think of operations as an integral part of fund management," Hochschild concluded. "Until funds elevate their back office operations within their organization, these problems will continue to arise. The result will be shareholder dissatisfaction."

Ennis Brandon Computer Sees Break-Even in 1971

DALLAS – Arnold D. Palley, president, Ennis Brandon Computer Services, has informed his firm's shareholders that the company should break even during fiscal 1971.

"Our company has made good progress in a number of areas within the past year," Palley said. "We are now operating offices in Toledo, St. Louis, El Paso and a computer center in Dallas. Six Ennis Business Forms distributors in Texas, who are now also Ennis Brandon dealers, carry our message through 30 dealer salesmen to their nearly 8,000 dealer customers."

Palley said that the company is moving ahead on its program to increase the number of dealers selling its computer packages.

He went on to inform shareholders that the company's St. Louis office is now servicing about 55 farm implement dealers throughout the Midwest plus another 50 clients in other businesses.

"In our other offices," Palley reported, "Ennis Brandon now serves 13 public accountants and anticipates processing for 67 of their clients by the end of June, and 300 to 500 in six months."

The shareholders were also told that a facilities management contract with Ennis Business Forms and data processing services for Brandon/Gaynes Medical Systems, Inc., should contribute in excess of $100,000 in revenues during fiscal 1971.

During fiscal 1970 Ennis Brandon was in the developmental stages and had cash receipts of $851,997 and disbursements of $836,748 for a total cash loss of $11,751.

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Acquisitions

Compudat Scientific Systems, Inc., a computer software company headquartered in N.Y., announced the acquisition of **Syntactics, Inc.** for stock. Syntactics is engaged in developing computer software programs and furnishing computer consultation services to the securities and banking industries. Compudat, a subsidiary of Camin Laboratories, Inc., had been largely engaged in computer software and technical programs for aerospace company applications. For the time being Syntactics will be operated as a wholly owned subsidiary of Compudat.

Kenics Corp., Danvers, Mass., has acquired **LSI Systems Corp.**, Cambridge, Mass., a computer design, development and consulting firm whose LSI Systems adds to Kenics engineering capabilities the basic research in utilizing transducers for quantitative analysis.

Vidar Corp., Mountain View, Calif., and **Continental Telephone Corp.** St Louis, have agreed in principle on the terms of Vidar's proposed acquisition by Continental.

Computer Learning and Systems has agreed to acquire the **Institute of Computer Management Inc.** (ICM). The addition of ICM will provide the company with strong representation in Pittsburgh and Cleveland.

The Computer Exchange, Inc. has completed the acquisition of **Computer Synergy Inc.**, Oakland, Calif., for an undisclosed amount of stock. Computer Synergy provides facilities management to companies and institutions operating in-house electronic data processing systems.

Computing and Software, Inc. has acquired **Hodes-Daniel Co., Inc.** of Elmsford, N.Y., in exchange for an undisclosed number of shares of C&S stock. Hodes-Daniel creates and operates direct marketing programs stressing account acquisition and activation for a number of consumer finance companies and commercial banks throughout the U.S.

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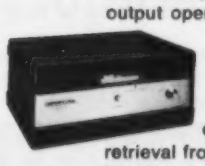

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Analysis

Is the 'Tail' a Movement Of Wishing-Makes-It-So?

By Michael Merritt
CW Staff Writer

Dear Mal,

I thought you'd like to see where we've been, so I'm sending this fancy chart along. You might find it interesting. Like the brokerage house that ran an ad in the Journal:

In Memoriam
All the Money You've Lost
in the Stock Market
1970

I remember back in the spring of 1968 when I was with the shoe company and you told me about this new software shop you were with. I'd never even heard of a stock option then. Started looking around, and sure enough by May I was an analyst for Interactive Digits.

Boy, that sure was a ride, wasn't it? By January I'd bought the new house using the stock as collateral. Sure had to scramble when Interactive folded, eh? Boy, those were the days!

Wish I could figure out how you always manage to psyche those moves, though.

Jumping over to Magic Minicomputers, Inc. last February was brilliant. Even getting a 20% raise out of it. And I had to get rid of the house anyway, so when LifeTime leasing offered me a job – with options – down in New York, well, I just had to take it. They were just starting to sort out their service shop, and wanted me to work up an accounting app for them. So I packed up the kids and got a house on Long Island.

Well, you know the story there. That sorting out took a little more time than LifeTime had, so when they merged with the insurance company and IBM took the computers back, I talked to the shoe company and here I am back again.

Ed told me that you and a marketing man and a couple of engineers from Magic have started up a company of your own. Making disk drives, was it? Let me know how it comes out, will you? I'm trying to scrape up some money to send the kids to college, and all my broker talks about is war, recession, inflation, and his wife doing without a maid. And, you know, Mal, I sure miss those stock options. So before you go public, how about letting an old friend in for a little?

Say hello to Madge for me.

Yours truly,
Sam

Sam's letter pins the tail right on the donkey – that interesting little tail at the end of the stock chart. After all, who doesn't want the market to go up again?

But Sam's broker is more likely right. None of the fundamental factors underlying the market have changed. We are still fighting a war, and even if we pull out, defense spending will remain at inflationary levels while the generals rebuild the army.

Corporate capital spending has barely begun to drop. Inflation is still creeping up, and the only response the government's anti-inflation moves are getting are increased unemployment rates.

When it comes to the stock market, however, it's a slightly different story. As the fever chart on this page shows, in the stock market wishing makes it so. If enough people think a stock is going to go – and buy it – then the stock goes.

This is even more significant when it comes to stocks involving computers. It's only the glamor of growth and the psychology of a gold rush that can push stocks to price/earnings ratios in the hundreds, (making the kind assumption that there indeed are any earnings at all).

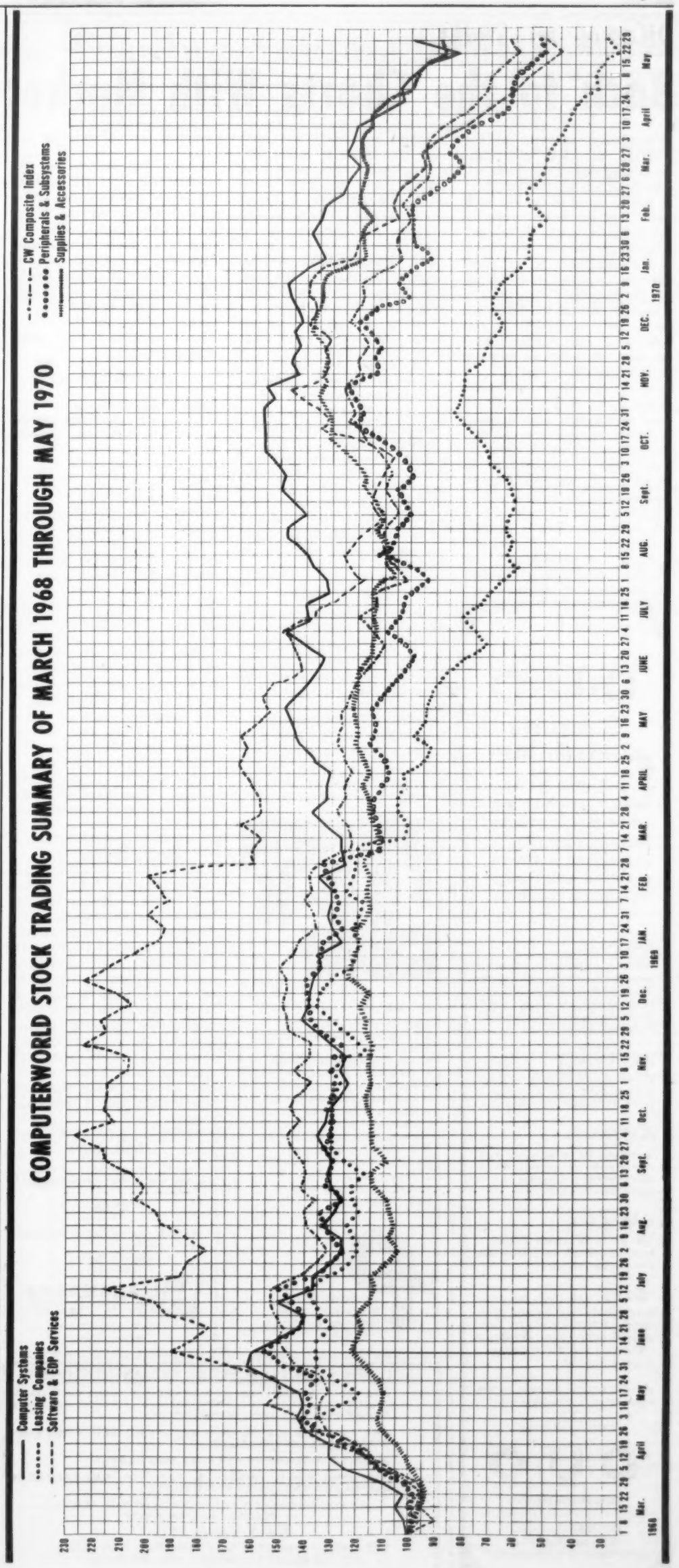
One has to consider a very elusive quantity, market psychology, as well as fundamentals when contemplating that seductive little tail on the end of the chart.

Automobiles in the twenties to electronics in the fifties, many new industries have experienced a pattern of stock action marked by speculative boom first, then crash and shaking out, and ending in a mature plateau. The computer industry has certainly had its speculative boom; the question is whether it is into the crash. The CW composite index peaked at 153 in June, 1968, and has now come down to the high sixties. A drop of over 50% isn't mashed potatoes.

But still, who doesn't want stocks to go up again, whether or not it's healthy to maintain inflated prices. Is the tail, that little shining reaction to all the money that has disappeared in the last year, a mass movement of wishing-makes-it-so?

If it is, this could be one bad market to be in. When psychology becomes completely dominant over fundamentals it's just as easy for prices to fall 200 points in a few days as it is for them to rise 70, and nobody can tell which is going to happen.

Maybe it's time to quit the gold rush and go back East to the shoe company.



Earnings Reports

ELECTRONIC COMP

Three Months Ended March 31

	1970	a1969
Shr Ernd	$.04	.....
Revenue	881,720	.....
Earnings	27,000	.....

a-Comparable figures not yet available as they are being restated for accounting changes. The company expects the 1969 figures to show a slight loss.

INFORMATICS INC.

Year Ended March 28

	1970	1969
Shr Ernd	.....	a$.42
Revenue	$19,070,000	11,548,000
Spec Items	d4,002,000	c35,000
Loss	4,243,000	e561,000

a-Based on income before special items. b-Income. c-Credit; from tax loss carry-forward. d-Loss from discontinuance of data center operations. e-Income; equal to 45 cents a share.

DiComes on Stocks

Back to the Charts With Market Confidence Justified

Considering what the market told us the week before last when sluggards and cowards saw a 69-point advance in three days as a final proof of the old hack that "Cowards don't belong in the stock market!", let us then take solace in our often-questioned confidence in the economy and relative values of our computer stocks!

A short look at the record of our beliefs (expressed in this column) is now history. From the first of April we believed that prices were too low. A so-called tax-selling public collapsed into a herd of war-frightened money-tight, fearful investors who played follow the leaders (the bears) down the primrose path. We seemed to be wrong as we watched a model portfolio shrink from 100% to 76% of its value!

A fearsome record to behold? Certainly, but like a modern Candide, we looked on the bright side. Our confidence (without an "I told you so!" attitude) apparently was justified. Our shock at seeing Burroughs below 100; alarm over bargain prices in Digital Equipment, IBM, RCA, IT&T, Potter Instruments, Foxboro, and others, has proved to be righteous.

The selling climax we anticipated, heralded for so long, (and prayed for) came – not with a bang, but a whimper.

Now we can go back to our charts, our old rules of basic values, our personal knowledge, and read them as we see them. On this path to rephoenixed sobriety (and/or clear thinking), let us touch lightly on our favorites and reappraise them for the future.

> Educated at Harvard, Robert DiComes is a retired broker who spends his time managing his stock and real estate portfolios, and a farm in New Hampshire.

No Basic Change

There is no basic change in our thoughts about these companies, but for the record, we will again take definite stands! For brevity, only three recommendations will be used: Buy, Hold, or Sell/Avoid.

Because of space limitations, I have taken for my first comments two sections of *Computerworld*'s Stock Trading Summary – Supplies and Accessories, and Computer Systems.

I realize full well the hue and cry that will come with some of my above decisions, but please remember that my results are derived from what I believe is a very broad look at each company plus its ability to perform in the market. It may be one of the best companies in its field but if it is not in tune with the general swings of the market then it must be a Hold rather than an active Buy.

Harsh Judgments

Sell/Avoid speaks for itself: there is an underlying reason why I believe this last category offers nothing in the market for computer stocks. Harsh judgments, yes; but let's call them as we see them!

Many of the above-rated companies are diversified enough that even if they can not perform in a favorable computer stock market, then they probably equate with others facets of the product mix. GE, IBM, and NCR are examples of this line of reasoning.

Their product mix may hold them back in noncomputer lines and make them, therefore, Holds. Xerox, though light in the computer field so far as general product mix is concerned, has other facets working which make it a strong Buy!

The Buy-Nows more than speak for themselves. At current prices, they can be bought any day.

My model portfolio of $10,000 is now standing at about 75% of its purchase value. With a loss of almost 100 points in the Dow-Jones Average since its inception, a 25% loss, though not appreciated, is acceptable in such a tight field. Of the six stocks now held, Burroughs, Digital Equipment, Foxboro, and Wang have been rated [see box]. For the remaining two (Potter Instruments and Telex), I rate them as Buys!

SUPPLIES AND ACCESSORIES

Exchange	Security	Close 5/29/70	Rating
N	Adams-Millis	10-1/2	Buy
A	Barry-Wright	9-3/8	Buy
A	Data Documents	19-1/4	Hold
N	Ennis Bus. Forms	13	Hold
N	Memorex	76-3/8	Hold
N	MMM	84-1/2	Buy-*Now*
N	Nashua Corp.	24-1/2	Hold
N	Uarco	26-3/8	Buy
A	Wabash Magnetics	10-3/8	Hold
	COMPUTER SYSTEMS		
N	Burroughs	122-3/8	Buy-*Now*
N	Collins Radio	17-1/4	Sell/Avoid
N	Control Data	38-1/8	Sell/Avoid
A	Digital Equip.	68-1/2	Buy-*Now*
N	Electronics Assoc.	5-5/8	Hold
A	Electronic Eng.	4-7/8	Sell/Avoid
N	Foxboro	25	Buy-*Now*
N	GE	66-3/8	Hold
N	Hewlett-Packard	28-7/8	Hold
N	Honeywell	88-5/8	Hold
N	IBM	278	Hold
N	NCR	56	Hold
N	RCA	23-3/8	Hold
N	Raytheon	20-1/4	Buy-*Now*
N	Sperry Rand	28-3/4	Buy
A	Systems Eng.	17-1/8	Sell/Avoid
N	Varian	15-7/8	Sell/Avoid
A	Wang	23-1/2	Hold
N	Xerox	82	Buy-*Now*

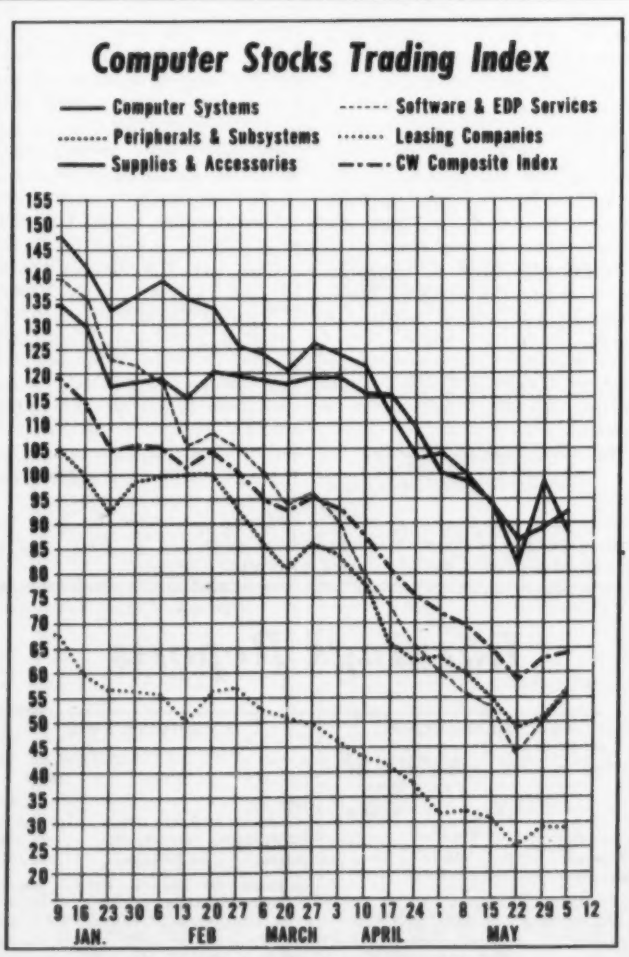
N=NYSE
A=ASE

DiComes' Portfolio Evaluation

Acquisitions

Computing and Software, Inc., and Aquila Computer Services, Ltd., and Berthiaume, St. Pierre, Theriauldt and Associates, Inc. (BST) of Montreal, Canada, have completed their proposed merger agreement. Aquila-BST offers proprietary packaged information systems and provides information processing applications for the insurance industry throughout Canada. The newly acquired organization will be part of Computing and Software's information processing group.

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

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Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, JUNE 5;
OVER THE COUNTER AND NATIONAL STOCK EXCHANGE, THURSDAY, JUNE 4

SUPPLIES & ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	15- 8	10	ADAMS-MILLIS CORP	- 1/2	- 4.76
O	21- 12	12 1/2	BALTIMORE BUS FORM	---	----
A	25- 7	9 5/8	BARRY WRIGHT	+ 1/4	+ 2.67
A	35- 17	20 1/2	DATA DOCUMENTS	+ 1 1/4	+ 6.49
N	19- 12	14 5/8	ENNIS BUS. FORMS	+ 1 5/8	+ 12.50
O	17- 8	9 1/2	GRAPHIC CONTROLSCORP	+ 1/2	+ 5.56
N	166- 63	79	MEMOREX	+ 3	+ 3.95
N	114- 77	85 3/8	3M COMPANY	+ 7/8	+ 1.04
O	38- 29	30 3/4	MOORE BUS FORMS	+ 3/8	+ 1.23
N	43- 21	26 3/4	NASHUA CORP.	+ 2 1/4	+ 9.18
O	48- 30	35	REYNOLDS & REYNOLD	+ 4 1/2	+ 14.75
O	30- 21	22	STANDARD REGISTER	- 1 3/4	- 7.37
N	39- 25	26 1/2	UARCO	+ 1/8	+ 0.47
A	30- 8	11 3/8	WABASH MAGNETICS	+ 1	+ 9.64
O	41- 25	32	WALLACE BUS FORMS	+ 6	+ 23.08

COMPUTER SYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	172-100	116 3/8	BURROUGHS CORP	- 5 5/8	- 4.61
N	37- 14	17 1/4	COLLINS RADIO	---	----
N	122- 35	42	CONTROL DATA CORP	+ 3 7/8	+ 10.16
A	124- 57	68	DIGITAL EQUIPMENT	- 1/2	- 0.73
N	11- 4	5 1/4	ELECTRONIC ASSOC.	- 3/8	- 6.67
A	14- 3	5 1/4	ELECTRONIC ENGINEER.	+ 3/8	+ 7.69
N	39- 22	25 1/4	FOXBORO	+ 1/4	+ 1.00
O	42- 12	16 1/2	GENERAL AUTOMATION	+ 3 3/4	+ 29.41
N	77- 60	66 5/8	GENERAL ELECTRIC	+ 1/4	+ 0.38
N	45- 26	28 1/4	HEWLETT-PACKARD CO	- 5/8	- 2.16
N	152- 73	89	HONEYWELL INC	+ 3/8	+ 0.42
N	387-237	270	IBM	- 8 1/4	- 2.96
N	86- 48	53	NCR	- 3	- 5.36
N	34- 20	22 1/4	RCA	- 1 1/8	- 4.81
N	33- 16	21 3/4	RAYTHEON CO	+ 1 3/4	+ 8.75
O	8- 2	4 1/4	SCI. CONTROL CORP.	+ 1 1/4	+ 41.67
N	40- 24	26 1/4	SPERRY RAND	- 2 1/2	- 8.70
A	49- 14	16 1/2	SYSTEMS ENG. LABS	- 5/8	- 3.65
N	79- 12	15 1/8	VARIAN ASSOCIATES	- 3/4	- 4.72
A	51- 21	25 1/2	WANG LABS.	+ 2	+ 8.51
N	115- 70	80 3/4	XEROX CORP	- 1 1/4	- 1.52

LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	9- 4	5 3/4	BANISTER CONTIN	+ 7/8	+ 17.95
O	25- 12	13 1/2	BOOTHE COMPUTER	+ 1	+ 8.00
O	8- 3	5 1/2	BRESNAHAN COMP.	+ 1 1/4	+ 29.41
O	8- 2	4	COMPUTER EXCHANGE	+ 1 1/2	+ 60.00
O	18- 4	---	COMPUTER LEASING	---	----
O	15- 2	3	CYBER-TRONICS	+ 1/4	+ 9.09
N	32- 6	12	DATA PROC. F & G	+ 3	+ 33.33
O	8- 3	4 1/4	DATRONIC RENTAL	+ 1 1/4	+ 41.67
A	24- 10	13 1/4	DEARBORN COMPUTER	+ 1/2	+ 3.92
O	8- 4	4 1/2	DIEBOLD COMP. LEAS.	+ 1/4	+ 5.88
A	10- 3	5 3/8	DPA. INC.	+ 7/8	+ 19.44
A	22- 7	12	GRANITE MGT	+ 2 5/8	+ 28.00
A	44- 5	7 1/2	GREYHOUND COMPUTER	- 1/8	- 1.64
N	30- 7	11 1/8	LEASCO DATA PROC.	- 1/4	- 2.20
O	5- 2	3	LECTRO COMP LEAS	+ 3/8	+ 14.29
A	19- 3	6 5/8	LEVIN-TOWNSEND CMP	---	----
O	3- 1	1 7/8	LMC DATA. INC.	+ 1/8	+ 7.14
O	4- 1	2 3/8	MANAGEMENT ASSIST	+ 1/2	+ 26.67
O	8- 3	4 3/8	NCC LEASING	- 1/4	- 5.41
O	8- 3	3 1/2	SYSTEM CAPITAL	+ 1/4	+ 7.69
A	19- 9	12 1/2	U.S. LEASING	- 3/8	- 2.91

PERIPHERALS & SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	62- 24	28	ADDRESSOGRAPH-MULT	+ 1/2	+ 1.82
O	14- 7	4 1/8	ALPHANUMERIC	+ 1/2	+ 13.79
N	48- 13	17 3/4	AMPEX CORP	- 3/4	- 4.05
A	34- 5	8	ASTRODATA	- 1/4	- 3.03
O	11- 5	7 1/2	BOLT,BERANEK & NEW	+ 1	+ 15.38
N	14- 6	8 1/8	BUNKER-RAMO	---	----
A	33- 13	18 1/2	CALCOMP	+ 2 7/8	+ 18.40
O	13- 4	6 1/4	COGNITRONICS	+ 1/4	+ 4.17
O	12- 5	5 3/4	COLORADO INST.	- 1/4	- 4.17
O	36- 8	12 1/2	COMPUTER COMMUN.	+ 4 1/2	+ 56.25
A	12- 3	5 1/8	COMPUTER EQUIPMENT	- 1/2	- 8.89
A	28- 13	17 1/2	COMPUTEST	---	----
A	35- 7	10 1/8	DATA PRODUCTS CORP	- 3/8	- 3.57
O	23- 6	11 1/2	DATA TECHNOLOGY	+ 4 1/2	+ 64.29
O	13- 5	6 1/4	DIGITRONICS	+ 1/2	+ 8.70
N	40- 10	15 3/4	ELECTRONIC M & M	- 1 3/4	- 10.00
O	8- 3	4 7/8	FABRI-TEK	+ 7/8	+ 21.88
O	17- 2	4 5/8	FARRINGTON MFG	+ 2	+ 76.19
O	20- 6	8 1/4	INFORMATION DIS	+ 1 3/4	+ 26.92
A	67- 17	21 3/4	MARSHALL INDUSTRIES	+ 5/8	+ 2.96
A	84- 15	20 3/8	MILGO ELECTRONICS	+ 1 1/8	+ 5.84
N	87- 27	33 3/4	MOHAWK DATA SCI.	+ 2 1/4	+ 7.14
O	52- 16	23	OPTICAL SCANNING	- 2	- 8.00
O	17- 4	6	PHOTON	+ 1/4	+ 4.35
C	4- 1	1 3/4	PHOTO-MAGNETIC SYS.	---	----
A	42- 23	26 1/2	POTTER INSTRUMENT	+ 3/8	+ 1.44
O	25- 12	15 1/2	PRECISION INST.	+ 1	+ 6.90
O	83- 21	37	RECOGNITION EQUIP	+13	+ 54.17
O	34- 6	8 3/4	REDCOR CORP.	+ 1 3/4	+ 25.00
N	29- 9	12 1/4	SANDERS ASSOCIATES	+ 7/8	+ 7.69
O	53- 7	14	SCAN DATA	+ 5	+ 55.56
O	23- 10	14	TALLY CORP.	+ 2 1/2	+ 21.74
N	25- 11	14 7/8	TELEX	+ 3/4	+ 5.31
O	50- 9	9 1/2	VIATRON	- 3 1/2	- 26.92

SOFTWARE & EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	6- 2	2 1/2	ADVANCED COMP TECH	+ 1/4	+ 11.11
A	24- 4	5 1/4	APPLIED DATA RES.	- 5/8	- 10.64
O	18- 4	5 3/4	APPLIED LOGIC	+ 1 1/4	+ 27.78
O	8- 1	2	ARIES	---	----
A	47- 23	30 3/8	AUTOMATIC DATA PRC	+ 1 1/8	+ 3.85
O	14- 5	9 1/2	AUTO SCIENCES	+ 3 3/4	+ 65.22
O	9- 2	4 1/4	BRANDON APPL SYS	+ 1 3/4	+ 70.00
O	3- 1	1 1/2	COMPUTER AGE INDUS.	+ 1/4	+ 20.00
A	12- 2	3 3/8	COMPUTER APPL	- 1/8	- 3.57
O	14- 3	5	COMPUTER ENVIRON	+ 1	+ 25.00
NAT	10- 3	---	COMPUTER INDUS.	---	----
O	11- 3	3 1/2	COMPUTER NETWORK	---	----
O	15- 5	8 1/4	COMP. PROPERTY	+ 1/4	+ 3.12
N	34- 7	11 3/8	COMPUTER SCIENCES	+ 1/2	+ 4.60
O	8- 4	5 3/8	COMPUTER USAGE	+ 7/8	+ 19.44
A	75- 18	24 3/4	COMPUTING & SOFT	- 2 5/8	- 9.59
O	9- 2	3 1/2	COMRESS	+ 5/8	+ 21.74
O	14- 2	4	COMSHARE	+ 1 1/4	+ 45.45
O	3- 1	1 1/2	CONSOL. ANAL. CENT.	+ 1/4	+ 20.00
O	24- 4	5 3/4	DATA AUTOMATION	+ 3/8	+ 6.98
O	28- 9	12 1/4	DATA PACKAGING	+ 2 3/4	+ 28.95
O	6- 1	2 1/2	DATAMATION SERVICE	+ 5/8	+ 33.33
O	9- 5	7 1/4	DATATAB	+ 1	+ 16.00
O	4- 1	2 1/2	DIGITEK	+ 3/4	+ 42.86
O	13- 5	8 1/4	EDP RESOURCES	+ 2 1/2	+ 43.48
A	11- 5	6 7/8	ELECT COMP PROG	- 1/2	- 6.78
O	161- 31	37	ELECTRONIC DATA SYS.	+ 2	+ 5.71
O	20- 4	7 7/8	INFORMATICS	+ 2 7/8	+ 57.50
A	25- 6	9 3/4	ITEL	+ 1 3/8	+ 16.42
O	13- 1	13 1/4	LEVIN-TOWNSEND SERV.	+12 1/4	+1225.00
A	25- 11	14	MANAGEMENT DATA	+ 1/4	+ 1.82
O	8- 3	3 1/4	NAT COMP ANALYSTS	---	----
O	12- 3	9 1/2	NAT.COMP. SERV.	+ 2 1/2	+ 35.71
N	54- 13	19 1/4	PLANNING RESEARCH	- 1 1/4	- 6.10
O	27- 9	12 1/2	PROGRAMMING METHODS	+ 3	+ 31.58
O	5- 2	3	PROGRAMMING & SYS	+ 7/8	+ 41.18
O	33- 3	6 1/2	PROGRAMMING SCIENCES	+ 3	+ 85.71
N	14- 4	5 1/2	SCIENTIFIC RESOURCES	+ 1/8	+ 2.33
O	2- 1	1 1/4	SOFTWARE SYSTEMS	+ 1/4	+ 25.00
C	27- 6	8	TBS COMP CENT INC.	+ 1/2	+ 6.67
O	4- 2	3 5/8	UNITED DATA CENTER	- 1/4	- 6.45
N	99- 19	25 1/8	UNIVERSITY COMP.	+ 1 3/8	+ 5.79
A	20- 5	7 1/4	URS SYSTEMS	+ 1/8	+ 1.75
O	13- 3	3 1/2	U.S. TIME SHARING	---	----

New Registrations

CONSOLIDATED SOFTWARE, INC., 8408 Arlington Blvd., Fairfax, Va., a company organized to engage in the business of designing and marketing computer programs and related documentary material ("software packages"), filed to register 300,000 shares of common stock. Proceeds, valued at $4 per share maximum, intended to be applied to the payment of bank loans and other indebtedness, to prepay in part an outstanding convertible note, and the balance for payment of the cost of the company's program for the establishment of its business of marketing software packages. The underwriter is Provident Securities, Inc., 32 Broadway, New York.

MATROGRAPHICS, INC., 511 Center Ave., Mamaroneck, N.Y., a company engaged in research, development and design of a computer pagination system, using to the extent possible certain rights acquired from Datatronics, Inc., filed to register 150,000 shares of common stock. Proceeds, at $8 per share, intended for establishing production facilities for the manufacture of a pagination system, for the employment of additional personnel and for the initial production rungs of the pagination system through 1972. The balance will be used for general corporate purposes including working capital. The underwriter is Frank Ginberg & Co., Inc., 50 Broadway, N.Y.

DELTA DATA SYSTEMS CORP., 1765 Woodhaven Dr., Cornwells Heights, Pa., a company that designs, manufactures and sells computer peripheral devices, principally remote visual display terminals, filed to register 400,000 shares of common stock. Proceeds, at $10 per share maximum, intended for expanding its marketing activities, for research and the development of new products, to purchase production and engineering equipment, for inventory buildup, and to repay notes held by certain stockholders. The balance will be added to working capital, except that which may be invested in a subsidiary to provide permanent financing for the leasing of equipment manufactured by the company. The underwriter is Thomson & McKinnon, Auchincloss Inc., 2 Broadway, New York.

TERMINAL DATA CORP., 16130 Stagg St., Van Nuys, Calif. 91406, a company which manufactures two microfilm recording and retrieval systems for use with electronic data processing systems: the ScannerMate System which automatically microfilms large volumes of computer processed documents, such as credit card receipts, airline tickets, and bank checks; and the DisplayMate System (which makes permanent microfilm records of computer output as it is displayed on a CRT screen), filed to register 100,000 shares of common stock. Proceeds, at $10 per share maximum, intended for inventories of raw materials and work in process, for production start-up costs, principally for the ScannerMate, and for microfile retrieval systems and for marketing expenses; the balance will be added to the company's working capital and used for general corporate purposes. The underwriter is Union Western Securities Corp., 8648 Wilshire Blvd., Beverly Hills, Calif.

PROGRAMMED PERSONAL SERVICES CORP., 666 Fifth Ave., New York, N.Y., a company engaged in developing and operating computer services, to provide the general consumer with direct access by telephone and other means to computerized information in selected fields in which management believes that a demand exists or can be stimulated therefore, filed to register 250,000 shares of common stock. Proceeds, at $6 a share, intended to discharge the company's 8% notes have been or will be used to meet operating expenses of the company, and will be applied to the establishment of separate computerized facilities in the Los Angeles area for the extension of the company's working capital and used for general corporate purposes. The underwriter is E.P. Seggos & Co., Inc.

NATIONAL CASH REGISTER CO., Main and K Sts., Dayton, Ohio, a company engaged in the design, production, distribution and servicing of business equipment and machines, together with supplies and related accessories, filed to register $150,000,000 of convertible subordinated debentures due 1995. Net proceeds of its debenture sale will be added to the company's general funds and used for general funds corporate purposes including increased capital necessary to provide expanded production facilities and additional working capital, investment in rental equipment and application toward payment of domestic short-term debt. The underwriter is Dillon, Read & Co., Inc., 46 William St., New York, N.Y.

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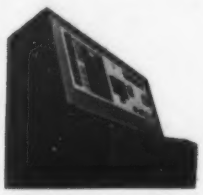

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